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Observations on the Clinical Aspects of Bovine Mastitis *

By

G. H. ARTHUR

SCHOOL OF VETERINARY SCIENCE, UNIVERSITY OF LIVERPOOL

INTRODUCTION

The observations recorded in this paper were made during the period September, 1941—September, 1946, in a group of four herds of dairy cattle attached to the Field Station of the School. They comprised approximately 300 Ayrshire, 150 Friesian and 50 of the Shorthorn type. Two of the herds were attested, one was being upgraded to tuberculin-test standard and one was an ordinary commercial herd with a high proportion of tuberculin reactors. All milking was by machine (the bucket type) and as is usual in Cheshire the cattle were housed during the winter months. Clinical cases of mastitis only were dealt with and no routine sampling of apparently normal animals was undertaken. Help was sought early in all cases so that it was possible to make a study of the whole course of the disease. Samples of secretion from affected quarters were taken for bacteriological examination before treatment and in some cases after treatment. Points to which attention was paid were: degree and type of the inflammatory reaction and character of the secretion, the presence of external teat lesions, and the patency of the teat duct and streak canal, in addition to the routine examination for systemic illness. A total of 395 affected quarters was attended. This figure includes the same quarter more than once when such a quarter was involved in several distinct attacks of the disease. The bacteria isolated, either alone or in association with other organisms, were as follows: —

Corynebacterium pyogenes	71
Streptococcus agalactiae	66
„ group C	61*
Other Streptococci	32†
Staphylococci	35
Mycobacterium tuberculosis	6
Cultures negative	45

* This figure includes *Streptococcus dysgalactiae*.
† „ „ „ „ *uberis*.

General Observations

Clinical Classification.—In those cases in which there was severe local inflammation, with marked heat, pain, swelling and a grossly abnormal secretion, together with a significantly increased pulse rate and rise in body temperature, the attack was classed as acute. Where there was a less severe local inflammation and no systemic disturbance, the term subacute was used. In the remainder, in which there was a variable degree of fibrosis of a quarter without gross change in the secretion, or where the secretion was altered without appreciable tissue reaction, the case was termed chronic or mild. The incidence of these types was as follows: —

Acute	133
Subacute	84
Chronic and mild	153

TABLE I

Clinical Classification in Relation to Associated Bacteria

	Acute	*Subacute*	*Chronic or mild*
C. pyogenes	54	6	4
Str. agalactiae	12	27	51
Streptococcus group C ...	48	17	14
Other streptococci	21	19	4
Staphylococci	9	9	39
Mycobact. tuberculosis ...	2	1	3
Cultures negative	12	15	28

* Presented to the Lancashire Veterinary Association at Manchester, October 31st, 1946.

It will be seen from Table I that the organisms most frequently associated with the acute form of the disease were *C. pyogenes* and group C streptococci. Those which occurred with greatest regularity in chronic or mild infections were *Str. agalactiae* and staphylococci. The number of bacteriologically negative samples was surprisingly high in all clinical types and these occasion much interest, for if, as is generally accepted, bacteria play the essential role in the causation of mastitis, it must be inferred that the method of collection of the sample was inappropriate, the bacteriological methods employed were inadequate or organisms were present but not viable. This high incidence of bacteriologically sterile secretions, from glands clinically inflamed, and also in which the cellular changes observed microscopically indicated inflammation, has had a sobering influence on our enthusiasm for remedies.

Quarters involved (percentages).—Left fore, 18; left hind, 27; right fore, 24; right hind, 30.

TABLE II

Seasonal Incidence. (Percentages)

January ...	9·1	July	6·4
February ...	7·0	August ...	21·9
March	10·0	September ...	14·7
April	6·4	October ...	5·2
May	3·0	November ...	8·1
June	5·2	December ...	2·8

The interesting feature of the figures in Table II is the strikingly high incidence during the months of August and September; more than twice the number of attacks occurred in August than in any other month except September. The main reason for this is the large number of cows which are dry or are being dried off at this time, for such animals are more likely to show infections with *C. pyogenes* and *Str. agalactiae*. The seasonal incidence of summer mastitis is considered in greater detail later. It is also of interest to note that although it is generally accepted that the health of dairy cows is at its lowest during February, March and April, there is no increase in the mastitis incidence at this time.

Relative incidence during the lactating and dry periods.—62 per cent. of cases occurred in lactating cows and the remaining 38 per cent. in cows which were dry, or being dried off, and in heifers (maiden or pregnant) which had not yet lactated. When it is remembered that the average cow is dry for one or two months only, it is obvious that the relative incidence during the dry period is very high as compared with that which occurs during the lactating period. This frequency of the disease during the dry period should be noted in relation to possible routes of infection, for dry animals are not subjected to possible teat trauma by hand or machine and their teat meati are usually sealed by a plug of caseous material.

The incidence of external teat lesions in relation to mastitis.—Lesions of the skin of the teat were present in 17 per cent. of cases. The teat lesions observed most commonly were epidermal proliferations in the form of warts. They were seen both in milking cows and in maiden and pregnant heifers and there were a number of clinical differences which occurred between the growths associated with these respective types of animal, but the conclusion formed was that the presence of such warts was not associated with an increased mastitis rate. There were, however, other teat lesions and these included sores and ulcers of uncertain aetiology, wounds resulting from treads and lacerations and inflammation of the streak canal either prior to or following surgical interference. With this type of injury a high incidence of mastitis due to group C streptococci and *C. pyogenes* was observed. Our observations also tended to indicate that a definite relationship existed between the degree of teat or udder trauma and the bacterial flora of the mastitis which subsequently developed. Thus, moderate trauma was often associated with acute streptococcal infection while severe injury was almost invariably followed by acute, destructive *C. pyogenes* infection. Further, in several cases studied closely, it appeared that group C streptococci might establish themselves first and be followed later by *C. pyogenes*. This point is of interest in regard to our more recent finding of the coincidence of group C streptococci and *C. pyogenes* in acute summer mastitis.

At this point it is convenient to review our data relating to the outcome of surgical interference on the streak canal. McLean's operation for stricture was performed 12 times. The usual technique was adopted and only instruments which had been sterilized by boiling used. In six the outcome was successful in that a free milk flow was obtained without a clinical mastitis resulting; in three there was partial success in that milk flow was improved but was not normal and no mastitis developed. In the remaining three, however, acute *C. pyogenes* infection developed—as the result, it is believed, of the interference—and the gland was lost.

In one of the herds a strongly haemolytic variant of *Str. agalactiae* was encountered. The organism was often associated with acute mastitis and in other instances with inflammation of the teat apex ('Black Spot'), and subsequent stricture of the streak canal. The aetiology of these teat apex lesions is still obscure. They have been ascribed to infection with *F. necrophorus*, staphylococci and *Str. agalactiae*. It is certain that the inflammation often becomes a necrotic one and the lesion fails to heal. In two of the cases under review such a lesion began as a diffuse eczematous condition which involved the lower third of the teat and eventually became localized in and around the meatus. It was noteworthy that in one of these the lesion developed when the cow was dry.

Age Incidence.—With one exception—a staphylococcal mastitis which will be discussed later—the only cases met in uncalved heifers were of the acute summer type associated with group C streptococci and *C. pyogenes*. In regard to *Str. agalactiae* mastitis and possibly that caused by staphylococci and *Mycobact. tuberculosis*, incidence definitely tended to increase with age. This probably depended on the more prolonged opportunity for infection to occur and is related to the method of husbandry. Nevertheless, the writer is of the opinion that *Str. agalactiae* infection tends to occur in later life regardless of the frequency of possible contact contamination. In a new herd made up of recently calved heifers, it was noticed that group C streptococcal infections were more common than those due to *Str. agalactiae*, but later, when these animals had borne two or three calves, the latter infection predominated.

Herd Incidence.—Great variation occurred in the incidence of clinical mastitis in the four herds under review and also in the bacterial infection which predominated at any one time. In one, an old-established Friesian herd, the great majority of cases were associated at all times with *Str. agalactiae* infection. In a second, the newly established herd previously referred to, group C streptococci occurred most commonly during the first two years and only later did *Str. agalactiae* infection become prevalent. Nothing was found to indicate that different factors in animal husbandry altered the incidence of mastitis. In the herd in which *Str. agalactiae* was widespread but largely latent, it was thought that inefficient stripping was sometimes associated with a clinical flare-up. While the writer has no concrete evidence to offer in the matter, it is his definite impression that the incidence of mastitis is much less in hand- than machine-milked herds. Moreover, he has not paid detailed attention to breed incidence, but again his clinical experience is that it is more common in the Friesian and Ayrshire breeds than in Shorthorns.

Mastitis associated with *Corynebacterium pyogenes*

This organism was associated with mastitis in 71 quarters involving 54 cows. With a few exceptions the affection was acute and accompanied by marked systemic toxaemia.

Seasonal occurrence.—This was the most intriguing and constant factor. Distribution of cases was as follows:—

January	6	July	3
February	2	August	27
March	4	September	11
April	1	October	2
May	1	November	3
June	0	December	2

Thus, 54 per cent. occurred during August and September and in those which developed at other times there was usually a history of teat or udder injury, surgical interference or an already established acute streptococcal infection. There is little doubt that severe injury to the gland or teat predisposes to *C. pyogenes* infection.

Although it is likely that many more cows are dry during August and September than in other months, in preparation for winter milk production, this is not the entire explanation for the high incidence in these months, for it is uncommon to meet this acute infection in animals dry at other times of the year, although in the aggregate there are probably as many cows dry in the other months as in August and September. The cause of this seasonal incidence has provoked much discussion, chiefly of a speculative nature. We have paid attention to meteorological factors in August but have not found anything common to the days on which attacks occurred. We have also failed to discover a common factor in the vegetation or wetness of the so-called summer mastitis fields. The restricted seasonal incidence suggests strongly that an arthropod vector plays a part in the initiation of the disease. This view is a commonly accepted one and many of the preventive measures adopted are mainly of a fly-deterrent nature. At the same time it is our view that a search beyond the more ordinary flies which are prevalent throughout the whole of the summer and autumn is necessary. There is the possibility that the primary infective factor is a virus or rickettsia.

Age does not appear to play a significant part in the incidence of the condition although in the cases recorded in this review it was more common in glands which had functioned than in immature udders.

According to Lovell, R. (1939), the *C. pyogenes* anti-toxin content of bovine blood rises progressively with age and from this it would be reasonable to assume that old cows possessed an appreciable measure of toxin immunity which would at least reduce the severity of infection. This, however, is not the case, for in our experience older cows are equally susceptible to infection and in them attacks are of equal severity to heifers. Moreover, from a study of our cases there was nothing to indicate that any degree of immunity followed an attack of *C. pyogenes* mastitis. On the contrary, in several instances cows infected in one quarter developed the infection in another some days, weeks, months or even years after the primary attack.

The question arises—is there any time during the dry period when the gland is especially susceptible? The cases under review indicate that infection was more likely to occur toward the end of the dry period when the gland was undergoing rapid hypertrophy prior to the onset of parturition. In two cases in maiden heifers it was noticed that the fellow quarter to the one affected was at the time secreting a milk-like fluid. Kendrick, W. (1944) has reported similar cases and has suggested that the onset of secretion might be provoked by the animal licking its udder in response to the irritation of an insect bite.

Although cases of summer mastitis have been recorded in calves, the writer saw none in the herds in question. It may be significant that they were housed throughout the whole of the summer.

The Association of Other Bacteria with *C. pyogenes* in Summer Mastitis

In 23 (32 per cent.) cases *C. pyogenes* was preceded by or associated with streptococcal infection. The streptococci were mostly of the precipitating group C (Lancefield) or *Str. dysgalactiae* (whether these two organisms are identical is a matter of disagreement amongst bacteriologists). It is considered probable that this percentage would have been higher had the remaining cases been examined earlier. In this connection it should be stated that summer mastitis is often well established when first observed because dry cows and heifers tend to be neglected during the busy harvest season.

In the majority of cases both in dry cows and maiden and pregnant heifers, from which secretion was obtained early in the attack and before the supervention of the foetid, purulent phase, a streptococcus was present. Sometimes, however, this organism failed to grow in culture, yet freshly prepared stained smears of secretion showed active phagocytosis, leucocytes being packed with cocci, and with diphtheroid organisms lying free in the surrounding field. The presence of these streptococci may well be an essential factor in the establishment of *C. pyogenes* infection, and if this is so it may raise important points in relation to control and treatment, although the ecology of group C streptococci and *C. pyogenes* is similar.

Nothing in this enquiry indicated that infection of a gland at a previous lactation with *Str. agalactiae* predisposed it to summer mastitis during the dry period. In one herd the incidence of summer mastitis was as high at a time when *Str. agalactiae* infection did not exist as it was later when the latter disease became widespread. Moreover, eleven quarters of maiden or pregnant heifers were affected with acute *C. pyogenes* mastitis and it is reasonable to assume that they had not previously harboured *Str. agalactiae*.

C. pyogenes does not appear readily to establish itself in the lactating gland without previous traumatic injury. Three such cases, however, were encountered and it is of great interest that one of these recovered both clinically and bacteriologically. The reason the organism does not often invade the functioning udder is possibly due to the anti-bacterial properties of the milk.

In general, the writer's experience of summer mastitis is that the gland which is likely to resolve to a degree whereby a measure of function is maintained is in the cow which calves a day or so after the onset of the attack.

A point of clinical interest is the great difference in the degree

of systemic ill-health between the typical *C. pyogenes* mastitis case and that of pyometra in which the same organism predominates. This fact also brings to mind the possibility that some other infective agent such as a virus is present and is largely responsible for the great systemic ill-health. The writer has noticed on blood examination of a few early cases that the leucocytes are much reduced in number initially and only later does leucocytosis occur. Such a finding has a parallel in known virus diseases, swine fever and panleucopenia of cats being examples. Other interesting features of the condition which point to some other infective factor being at work are the frequency of arthritis of the hocks and the changes which occur in the horn secreting corium of the hooves.

Comments on symptoms, prophylaxis and treatment.—The cases under review have not presented any unusual symptoms. None of the hyperacute, rapidly fatal type described by some writers was encountered, but there was great variation in the severity of the disease in different individuals. Thus caution was necessary before concluding that a certain form of treatment was beneficial. All cases showed toxaemia and fever but heifers were less ill than cows. In one case an affected cow aborted twins (221 days gestation) eleven days after the onset of the attack, and *C. pyogenes* was isolated from both foetal heart bloods. The secretory function of all glands affected by *C. pyogenes* mastitis during the dry period was lost despite treatment. Amongst the agents used by intramammary infusion or oral administration were: sulphanilamide, sulphapyridine, sulphacetamide, sulphone, "Surfen," "Metaphen," acriflavine and more recently penicillin. Early amputation of the teat to provide free and continuous drainage was also adopted.

In regard to prophylaxis, no significant reduction in incidence has been observed following bismuth-paraffin injections into the dry quarter, nor from the intramuscular injection of *C. pyogenes* toxoid (Lovell), and having regard to the apparent absence of resistance after a natural attack of the disease it was not surprising that toxoid was ineffective.

Mastitis Associated with Group C Streptococci

Group C streptococci have been associated with mastitis in 61 quarters involving 49 cows. Twenty-four fore and 37 hind quarters were affected and 62 per cent. occurred in lactating animals. In half of these there was a lesion of the teat. It comprised a scab-covered wound, an ulcer, a necrotic wart or an encircling fissure. This coincidence of teat lesions with group C streptococcal mastitis warrants further enquiry. The remaining 38 per cent.—23 cases—occurred in dry cows and heifers and of these 17 were encountered in August.

Speaking generally, the outcome of the infection in lactating cows was favourable and the affected quarter was very quickly restored to normal, often in a day or two. Sulphanilamide by the mouth, in the accepted course of doses, was given, but it is suspected that in many recovery was natural. Support for this view was provided by the recovery of a few without treatment and of others after the administration by the cowman of inadequate doses of the drug. In fact out of 61 cases in lactating and dry animals in which this organism was present alone, only six lost the quarter completely while six others showed atrophy and partial loss of function.

The clinical manifestations of acute group C streptococcal infection in lactating cows are intriguing. They are so rapid in onset and often in resolution also that one is reminded of allergic phenomena. For example, a cow may be normal at a morning milking yet nine or ten hours later be off her food with acute, painful swelling of a quarter and grossly altered secretion. The following morning the animal may be quite well again with the quarter and its secretion almost normal. One of the cases under review which suffered from the infection in an acute form early in lactation recovered sufficiently to give the highest recorded Ayrshire yield in Cheshire for the year.

There is a marked difference between the gland destroyed by group C streptococci and that lost from *C. pyogenes* infection. The former causes atrophy with, at most, a fine fibrosis and with no tendency to abscess formation, whereas the latter is associated with gross, coarse fibrosis, with "cording" of the teat duct and chronic abscessation.

Group C streptococci do not appear to have attained the same degree of parasitism as *Str. agalactiae* and it is uncommon to find them persist after apparent recovery. Nevertheless, initial infection is more often acute than is the case with the latter, although the writer is unable to distinguish clinically between the acute forms of the two infections. Another distinction between the two infections to which attention might be drawn is that group C infections tend to occur early in lactation and agalactiae infections to become obvious towards the end.

Udall (1938) has stated "where the rate of *Str. agalactiae* infection is high the rate of miscellaneous streptococcal infection is low." This has been our experience also.

Of the lactating cows involved in group C streptococcal mastitis, all except two were affected only once over a period of several years. Whether this resulted from acquired resistance or was simply chance was not clear, but such cows appeared to possess no enhanced resistance to *Str. agalactiae* infection. It is interesting to note that two of the animals in which the gland was lost due to group C infection were observed after a subsequent calving, but there was no restoration of function.

In the dry animal there appears to be a marked tendency for *C. pyogenes* to follow group C infection. This point has already been discussed.

Mastitis Associated with *Streptococcus agalactiae*

Sixty-six quarters affected with clinical mastitis, mostly of the chronic or mild type, showed *Str. agalactiae* in culture. The course of this disease is so well known that it is proposed to make only a few observations thereon. The disease was present in all our herds, but in a young, recently established one it did not appear to any extent until two or three years had elapsed, after which it became widespread. The infection can be diagnosed with a fair degree of certainty by simple examination of the secretion during the dry period. At this time, owing to the small volume of secretion the inflammatory products become aggregated and appear as small flakes in a viscid honey-like medium, or as larger coagula or as pus. In other cases the secretion comprises caseous material in a dirty, reddish-brown fluid.

In one herd a strongly β haemolytic variant of *Str. agalactiae* has been encountered. It was associated with peracute inflammation and was uninfluenced by the oral administration of sulphanilamide. In many, the affected gland was completely lost, while in others there was marked fibrosis and reduction in secretion. This organism also occurred in several cases of inflammation of the streak canal which led to stricture.

It is commonly stated that *Str. agalactiae* infection is essentially insidious in onset with the appearance of clots in the fore-milk and that later clinical exacerbations may occur. It is not uncommon, however, in newly calved heifers in an infected herd for the disease to take an acute destructive form in the first week or two of the lactation period.

In the majority of cases, sulphanilamide by the mouth has been used and the results have, in the aggregate, been satisfactory, but as an equilibrium tends to be set up between the organism and the host it is difficult to assess accurately the value of treatment. The writer is not enthusiastic in regard to infusion of the gland with flavine derivatives, for in his experience they have an irritant action with reduction of function in the lactating gland and the practical difficulties of maintaining surgical cleanliness under field conditions may be insurmountable. (The use of penicillin by udder infusion will be referred to in a later paper.)

Quarters which become atrophied as a result of acute agalactiae infection often give a good yield during subsequent lactations without treatment in the interim period: this is in marked contrast to group C infections.

Mastitis Associated with Untyped Streptococci

Not infrequently it was found that the streptococci isolated did not fall into the accepted groups. They were both haemolytic and non-haemolytic and occurred alone in 21 acute cases. They were probably variants of agalactiae and group C streptococci.

Mastitis Associated with Staphylococci

As will be seen from Tables I and II, a considerable proportion of the cases reviewed were associated with staphylococci. These organisms have often occurred in association with other accepted mastitis pathogens but in 19 cases occurred alone. The role played by staphylococci in the incidence of mastitis is a matter which requires much more study. The writer is inclined to the view that these organisms are less important than is generally accepted. During the period under review only two cases of the acute, gangrenous type were seen and neither of these was in the herds on which this report is based.

Staphylococci were isolated chiefly from chronic cases and clinically most were indistinguishable from chronic agalactiae cases. In two, however, the condition became "botriomycotic" and resembled chronic tuberculous mastitis. Two other cases with exceptional features are worthy of comment. One was in a heifer. By chance secretion was taken from her apparently normal udder just before calving. That from the right hind quarter comprised a dirty, brownish fluid with caseous clots which showed staphylococci in pure culture. On calving the animal milked normally on all quarters and has not had mastitis since. The second was

a lactating cow which developed acute mastitis. It was accompanied by marked and painful swelling of the teat. Function of the gland was completely lost followed by fibrosis.

No special treatment has been adopted for staphylococcal cases. The majority were given sulphanilamide at the outset and were it not for the fact that this agent is of little or no use in this infection, we should probably have ascribed therapeutic properties to it.

Mastitis in the Absence of Bacteria

It was surprising to find that secretion from 45 obviously inflamed quarters taken at the outset failed to reveal organisms in culture. It can only be concluded that organisms present had been killed by bactericidal properties present in the milk. It is important to realize that even in acute mastitis natural recoveries may occur and in this connection one is reminded of a statement by Nairn, W. (1938): "Veterinary literature can show many remedies for mastitis, but they have not enjoyed long life as a rule, and the apparent success in the case of many of them was due to the fact that they were applied to the acute type of case, which we know is likely to show more signs of improvement in its normal course, than we find in the chronic case."

It is not proposed to refer to tuberculous mastitis in this paper.

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The field work has been under the direction of Professor J. G. Wright, to whose inspiring enthusiasm we younger clinicians owe so much.

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Discussion

The discussion was opened by Mr. J. Berger, as follows: As was only to be expected we have once again, in this paper compiled by Mr. Arthur, had the privilege to hear observations of great interest and value, and in giving it a "certificate of soundness" I think one can truthfully say that such is the invariable finding with regard to the work of those at Neston.

Careful records of five years' mastitis work among some 500 dairy cattle must produce results of some importance, and it has been most intriguing to compare statistics with those taken in cases of clinical mastitis in general practice in another area of Cheshire over the last two years. For the sake of comparison I have drawn out a table but I do not propose to do more than point out the close similarity of some of the figures. I have omitted some 39 cases of old-standing mastitis which were encountered in routine treatment of infected dry cows. The majority of these came out of a few herds in which *Str. agalactiae* was known to be present in a high proportion of cows and, as I was looking for these cases especially for trial treatment, their inclusion would give a false impression in the table. In all but four of these *Str. agalactiae* was the organism isolated. Cases of tuberculous mastitis were not recorded.

	Acute	*Subacute*	*Chronic or Mild*	*Total*
Corynebacterium pyogenes ...	39	2	0	41
Streptococcus agalactiae	8	18	17	43
Group C Streptococci				
dysgalactiae	20	13	6	
pyogenes animal (Edwards) ...	6	0	0	45
Other Streptococci				
uberis	4	5	3	
Enterococcal	5	3	0	
Untyped	3	3	1	27
Staphylococci	8	0	2	10
Bacterium coli	1	1	0	2
Cultures negative	8	11	5	24
	102	56	34	192

These results support Mr. Arthur's findings that *C. pyogenes* and group C streptococci are the organisms most frequently associated with acute mastitis, and while staphylococci also appear in a high proportion of acute cases I have not found them so frequently associated with the chronic form of mastitis. Once again negative cultures appeared frequently in all types of cases.

I would lay great stress on one factor in Mr. Arthur's paper, and that is the general note of uneasiness as to the true aetiology of these udder changes and as to the extent to which the bacteria isolated are associated with the clinical manifestations. Since the advent of sulphonamide and penicillin therapy one has noted a great tendency to lose sight of factors other than the bacterial association in cases of mastitis. The gentleman who proclaimed that "If the Government spent £750,000 on penicillin, mastitis could be wiped out," would do better if he thought twice before making any further such harmful statements.

I have been lucky in having the opportunity of taking samples for bacterial examination in as many cases and as often as was necessary. This activity is, alas, not available to most of us practitioners and that laboratory aid is essential for efficient treatment or control, there is no possible doubt. The more I learn of the bacterial picture found in various secretion samples the more humble I feel and the less ready I am to diagnose on clinical symptoms. Apart from the advanced purulence of *C. pyogenes* infection, which simulates no other, one has found that the acute oedematous reaction suggested to be pathognomic of staphylococcal infection (Gould) may prove to be associated with group C streptococci, the acute painful quarter of the lactating cow indicating group C infection may prove to be associated with presence of a virulent type of *Str. agalactiae*, and the typical picture of chronic mastitis in a number of cows in one herd so often associated with *Str. agalactiae* may turn out to be *Str. uberis* or staphylococcal infection.

The fact that negative samples occur so frequently is surely a significant warning that there are factors other than bacteria exerting their influence. Time would not be wasted in pursuing further investigation for the presence of co-existing virus. One notes with satisfaction Mr. Arthur's parallel to acute allergic phenomena in some cases of acute mastitis. When first let loose on the mastitis world I would smile smugly when the cowman said "It's only a chill in the bag." Now I'm not so sure that draughts, dampness, and temperature changes may not have a good deal to do with some acute cases and that the cowman was not so far out in his diagnosis after all.

I come now to what I think is the most important point raised in Mr. Arthur's paper, *i.e.*, the association of group C streptococci with subsequent *C. pyogenes* infection and its implication in the results of treatment in cases of 'summer mastitis.' This association has been found in many cases in our area, while I have the impression that the case of chronic *Str. agalactiae* infection is also one which has an increased susceptibility to *C. pyogenes* infection. I have found that the number of cases occurring in herds before *Str. agalactiae* infection had been to some degree brought under control was greater than subsequently, having due regard to the general incidence of summer mastitis in the season concerned.

I believe many of the reported successful treatments of summer mastitis are largely due to the fact that the authors have been dealing with group C infection only. I have been surprised by the pleasing reactions seen in these quarters following sulphone infusion, and this in quarters which in previous years I should have taken to be typical early cases of *C. pyogenes* infection. In all but one case, however, in which *C. pyogenes* was isolated before treatment the result was the same—a lost quarter or one whose activity was thereafter practically nil. In a number of cases associated with *C. pyogenes* infection the organism has not been isolated in the first sample taken as it has been literally swamped out in culture by the precursory streptococcal infection.

Treatment of the case by udder infusion, once foetid purulence is present, is a waste of time with any of the drugs available at present, as is so well brought out by Mr. Arthur's case No. 81HH. His two other cases, 78P and 385J, in neither of which *C. pyogenes* was isolated, cannot be used for true comparison, for they bear out my argument that recovery is frequent in 'acute summer mastitis' provided this organism is not present. While agreeing that in many cases natural healing processes might produce complete recovery I believe that infusion of such quarters, with a view to checking streptococcal multiplication, is good therapy, and I would suggest that it is in the dry cow that our activities are likely to meet with most success. Infusion with sulphone in paste form is now such an easy task that it is much to be preferred to the more wasteful oral dosing.

I think one can safely count the flavines out as udder infusions, for a number of cases of *Str. agalactiae* infection treated with euflavine in as high a concentration as 1 in 1,000, left in the udder for as many as ten days, still showed active infection.

Penicillin and allied materials are likely to be of considerable use in cases of streptococcal infection, especially when it can be stored and applied as simply as can the sulphonamides.

Many of the cases mentioned by Mr. Arthur have borne out a fact that gives us a good deal of worry in practice. That is the

uncertain prognosis as to the future milking capacity of a quarter affected with mastitis. Contrary to the views of many authorities, one has noted high yields at subsequent lactations from quarters showing advanced induration, and the converse is also true. Atrophy of a quarter without induration is even more of an unknown quantity, for in my experience at a subsequent lactation its function may be anything from nil to 100 per cent.

In conclusion, I would congratulate Mr. Arthur on his excellent paper and ask him to carry on "exploring all avenues," for, until we know more about the aetiology of udder reactions, we practitioners are bound to go on trying to kill mastitis bacteria with something. The farmer on the whole does not like "masterful inactivity." He prefers "some of that white powder."

Mr. J. Francis said that the paper was of great interest as it gave the clearest picture yet presented of the clinical symptoms of mastitis associated with the various bacteriological infections and the best overall picture of the disease as it occurred in any one herd. In his (the speaker's) own work more attention had been given to the control of *Str. agalactiae* infection in the herd than to the treatment of individual clinical cases. In two heavily infected herds *Str. agalactiae* infection had been almost completely eradicated, largely by the use of 4:4'-diaminodiphenyl sulphone, and there had been a great decrease in the incidence of clinical mastitis (clots in the milk). He wondered whether the work Arthur had done on the treatment of clinical mastitis had reduced the general incidence of mastitis in the herds under observation. He believed that mastitis associated with *Str. agalactiae* was different from all other forms of mastitis in that it was an infectious disease spread from udder to udder and there was very little evidence that other sources of infection were of real importance. On the other hand, *C. pyogenes*, *Str. dysgalactiae*, *Str. uberis*, group C haemolytic streptococci and staphylococci could readily be isolated from the tonsil or vagina (*Vet. J.* 97. 243-251). It was of interest that both Arthur and Berger had noted the association between *Str. dysgalactiae* and *C. pyogenes*.

He also had found penicillin of little value in the treatment of summer mastitis and he and Berger had observed cases which were affected in all quarters at intervals of a month or more, which suggested that immunological procedure would be of little value in preventing the disease. The ineffectiveness of penicillin was in accord with experimental results, for although penicillin was highly active against *C. pyogenes* and *C. diphtheriae in vitro* and active against an acute infection in laboratory animals, it was almost inactive against chronic local lesions.

Mr. Ogilvie wished to know if smaller doses of penicillin had been tried and, if so, if the results obtained agreed with the recent findings of the Agricultural Research Council.

Mr. A. J. Wright thanked Mr. Arthur for his paper and Mr. Berger for opening the discussion. He was interested to hear of the large number of clinical cases which gave a negative bacteriological finding. He wished to know if in those cases of mastitis following the use of McLean's knife the original teat injuries were gross or only slight. He thought that in those cases of summer mastitis showing a mixed infection of *Streptococcus dysgalactiae* and *C. pyogenes* and where both *C. pyogenes* toxoid and sulphonamide were used, the disappearance of septicaemic disturbances was probably due to the action of the sulphonamide on the streptococcus. From present information he thought infection was carried by flies, the teat being the first point of infection. In his district the incidence of summer mastitis was chiefly in low lying districts which were well wooded and consequently flies were abundant. If he had cases on high land they occurred in the later months of summer, some four to six weeks later than the cases on low land. If a virus was implicated how did one account for the fact that summer mastitis occurred after rain or thundery weather? He had experienced a fairly heavy death-rate amongst heifers suffering from summer mastitis. The incidence of those cases of mastitis which were bacteriologically negative varied in different parts of the country. He had obtained the best results from udder infusions in the dry cow. He found that staphylococcal toxoid answered well in cases of acute staphylococcal mastitis or black garget, as it was commonly called. He thought that Mr. Arthur had passed too lightly over this condition. He was astounded at the amount of penicillin used and with little or no effect on *C. pyogenes*. In those cases of repeated attacks penicillin probably gave better results than sulphonamide. He would like to support Mr. Francis in treating *Str. agalactiae* as an infectious disease. He would like to ask Mr. Francis the best way to eradicate agalactia infection in a herd.

Mr. Francis answered this by saying: Treat dry cows with sulphone or penicillin and strict isolation following bacteriological examination of milk.

Mr. Bythell: Mixed infections were more prevalent in dry cows. Clinical cases were those indicated by examination of the milk by the strip cup. Sterile cases were a trouble, especially when the cow was coming to the top of her yield. *Str. agalactiae* was very infectious and should be treated as a herd infection.

Mr. T. S. Alderson thought no drug would be found to cure the summer mastitis quarter. For prophylactic treatment he had used a vaccine prepared by Dr. Hare which he also found of some use in streptococcal mastitis. He had also tried it as a preventive for summer mastitis, injecting dry cows in July. He had fewer cases in vaccinated than in unvaccinated herds. He had found that the infusion of the flavines had sometimes done good and at other times harm.

Mr. W. Tweed, having congratulated Mr. Arthur on his excellent paper, said that it would be a distinct advantage if there were more stations like Leahurst where adequate laboratory facilities were available to carry out research. He had found that where a herd had a high tuberculosis reactor incidence it also had a high mastitis incidence. He thought this was probably due to faulty herd management.

Mr. G. A. Willis: He used sulphonamide as a prophylactic for four days after any surgical interference with teats. He found that when trouble arose following teat surgery it usually commenced seven to ten days afterwards. He enquired as to the use of Van Rensburg's method of detecting mastitis with incubated milk.

Mr. J. Francis answered this query by stating that the method would detect the presence of streptococci but would not differentiate the species.

Mr. J. Holroyd: Over 30 years ago he was persuaded to give a paper on this same subject to the "Lancashire." In those days they knew little about the various bacteria which were now said to cause mastitis. They classified mastitis into acute and chronic catarrhal, acute and chronic parenchymatous and of course they recognized summer mastitis. They had none of the present range of drugs, chemicals and toxoids and yet he often wondered if the results of their present-day treatments were any better than those obtained previously. In the old days some cases recovered, some quarters were lost and some cows died. It seemed that this was the present experience. He wondered if too much stress was not laid on bacteriology and if the various organisms found were not the result of the disease and not the cause of it.

Professor J. G. Wright expressed keen appreciation of the paper: he knew that Mr. Arthur had spent a very considerable time on its preparation and had studied the subject from all angles. He thought that other factors than bacteria were involved in many cases of mastitis. We should aim at overcoming infection by natural resistance. Research workers should spend more time in the cowshed with the animal than in the laboratory.

The Reply

Mr. Arthur thanked the speakers for their appreciation of the paper and said that their remarks would give him encouragement to study further the mastitis problem. In general, there was a large measure of agreement with his observations, and this relieved him of making an extensive reply.

He, in turn, congratulated Mr. Berger who, in collaboration with Mr. Francis, found time, amidst the many and varied calls of agricultural practice, to follow so closely the bacteriology of his mastitis cases and to correlate laboratory findings with clinical observations.

Answering Mr. Francis, the speaker observed that he was not able to say whether treatment of clinical cases only of *Str. agalactiae* infection had resulted in a reduction in the incidence of this disease since they had not yet embarked on routine herd milk bacteriological examinations. At the same time, his impression was that it would be unlikely materially to reduce the incidence, but that it would help to limit the spread of the disease. He was in agreement with Mr. Francis and other speakers that *Str. agalactiae* infection should be treated as a contagious disease on a herd basis. He was not convinced, however, that sound methods of diagnosis and treatment were, at present, sufficiently available to combat this great scourge of dairy cows in the field.

In reply to Mr. Ogilvie and Mr. Wright he admitted that the doses of penicillin employed were large by comparison with those used by other workers. An initial trial with smaller doses in one case of *C. pyogenes* mastitis had been disappointing. They then decided to use very much larger doses, in the hope that, if these were successful, the quantity of drug could be reduced until the smallest effective dose was found. Replying further to Mr. Wright, the essayist said that in the cases of stricture of the streak canal treated surgically by means of McLean's knife, the original teat lesion was a slight one. Sulphanilamide had been used prophylactically in these cases, and Mr. Willis would be interested to know that in one of them, *C. pyogenes* mastitis developed while the cow was receiving a recognized optimal dosage of sulphanilamide by mouth.

REPORTS ON PENICILLIN

The Medical Research Council, acting on the advice of its Committee for Penicillin Synthesis, is making available for consultation by interested persons a number of reports on penicillin. Announcing this, *Nature* in its issue of April 26th states that in October, 1943, when many of the structural features of the penicillin molecule were becoming clear through the work carried out in Great Britain, the problem of the synthesis became a pressing one, and to handle this aspect, the Medical Research Council set up a Committee for Penicillin Synthesis "to initiate, co-ordinate and make investigations on the synthesis of penicillin and analogues." At the same time the Committee for Medical Research of the Office of Scientific Research and Development in Washington, which had already undertaken the co-ordination of chemical work on penicillin in the United States, came to an agreement with the Medical Research Council for an exchange of information on anything which had a bearing on the problem of the synthesis of penicillin. The confidential reports which were issued and exchanged are known in Great Britain as the C.P.S. reports. A number of reports known as the Pen. reports and sponsored by the Therapeutic Research Corporation of Great Britain contain much information of historical value on the earlier work carried out on the structure of penicillin.

All these reports, together with others sponsored by Imperial Chemical (Pharmaceuticals) Ltd., Merck and Co. Inc., and the Squibb Institute for Medical Research, are now available for consultation in certain libraries in Great Britain. In the London area the reports may be consulted in the libraries of the Royal Society; National Institute for Medical Research; British Drug Houses, Ltd.; Glaxo Laboratories, Ltd.; Wellcome Chemical Research Laboratories, Beckenham; May and Baker, Ltd., Dagenham; and in the provinces in the libraries of the Universities of Birmingham, Bristol, Cambridge, Glasgow, Manchester and Oxford. In the Nottingham area the reports may be consulted in the library of Boots Pure Drug Co., Ltd. The information contained in these reports cannot be made the subject of any publication before the Penicillin Monograph appears later in the year.

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The Registrar-General's "Return of Births, Deaths and Marriages for the December Quarter, 1946," published on March 30th last, recorded that the approximate reproduction rate for 1946 was 1·102, or 10 per cent. in excess of that required to maintain the population. This is the first time the rate has reached replacement level since 1922, when the corresponding figure was 1·013.

CLINICAL COMMUNICATIONS

A Preliminary Note on the Use of Penicillin in the Treatment of Acute Bovine Mastitis in Non-lactating Animals*

By

G. H. ARTHUR

School of Veterinary Science, University of Liverpool

This report comprises a record of ten cases of acute mastitis which occurred in dry cows and heifers during August and September, 1946.

While it is customary to describe such cases as "summer mastitis" and ascribe them to infection by *C. pyogenes*, the writer was aware from previous experience that the secretion from these cases would probably reveal a variety of organisms, *viz.*, the various cocci singly, or in association with *C. pyogenes*, or *C. pyogenes* alone. It is impossible to differentiate early cases by clinical examination only.

When planning the work, it was decided to use doses of penicillin greatly in excess of those recorded in America and this country for the treatment of *Str. agalactiae* mastitis, for a preliminary trial, in a case of acute *C. pyogenes* mastitis, carried out at a time when small quantities only of penicillin were available, indicated that repeated injections of 100,000 units resulted in no alteration in the natural course of the disease.

The sodium and calcium salts of penicillin were used in doses of 1,000,000 units, repeated on from three to eight occasions. The powdered drug was dissolved in freshly boiled tap water in a flask. The volume of water in which the penicillin was dissolved was governed by the type of animal concerned and the degree of inflammation present. In some cases of an acutely inflamed quarter it was not possible to inject more than 50 c.c., and in maiden heifers sometimes less. The flask was fitted with a rubber bung, perforated by a composite steel tube, which served as an air inlet and fluid outflow. To the exit tube was attached two feet of rubber tubing fitted with a teat cannula. Delivery tube and cannula were boiled before use and transported to the farm in the sterilizer. A fresh syphon was used for each quarter. Infusion was performed by positive pressure from a bellows after cleaning the teat meatus with alcohol. Quarters were re-infused at intervals of eight to 24 hours until improvement was shown or until, in the light of past experience, it was obvious that the case was not resolving and that further use of penicillin would be wasteful.

Ten quarters were treated. Samples of udder secretion for bacteriological examination were taken before, sometimes during and after treatment. The bacteriological reports on the pre-treatment samples were:—

One quarter sterile.
One quarter showed *Str. agalactiae* alone.
Two quarters showed *Str. dysgalactiae* alone.
Three quarters showed *C. pyogenes* alone.
One quarter showed Corynebacteria associated with untyped cocci.
One quarter showed Corynebacteria associated with *Str. dysgalactiae*.
One quarter showed untyped cocci followed by *C. pyogenes*.

Case Reports

No. 81 H.H. A pedigree Ayrshire in good condition, which had borne four calves. On 10.8.46 it was brought in from pasture with acute mastitis affecting the left hind-quarter. Parturition was imminent and colostrum or honey-colostrum was present in the three unaffected quarters. There was considerable inflammatory change in the L.H.Q., but there was no particular involvement, or lesion, of the teat. In fact, this was a case of typical acute "summer mastitis." Milking of the affected quarter was greatly resented; the secretion consisted of coarse caseous clots in a sanguineous fluid. This is the usual secretion in an early case of summer mastitis. It has no offensive smell at this stage. The temperature was 103·1° and pulse rate 96 per minute.

The bacteriological report on the pre-treatment sample was: "Leucocytes packed with cocci, *Str. dysgalactiae* in culture, corynebacteria free in the field, but *C. pyogenes* did not appear in the culture."

The treatment of this case and its outcome were as follows:—

10.8.46. 8 p.m. L.H.Q. stripped and infused with 1,000,000 units penicillin in 200 c.c. water. 12 p.m. Inflammation of quarter rather more marked. Secretion mostly serous. Inf. 1,000,000 units in 200 c.c.

11.8.46. 8 a.m. Affected quarter less inflamed in its lower third. Secretion, a bloody serum. T. 103·8°. Inf. 1,000,000 units in 200 c.c. 12 noon. Little change. Secretion serous with a few large translucent clots. T. 102·9°. Inf. 1,000,000 units in 200 c.c. 8 p.m. No change. Inf. 1,000,000 units in 200 c.c.

12.8.46. 8 a.m. No change. Inf. 1,000,000 units in 200 c.c. 8 p.m. Less inflammation in lower third of quarter. Inf. 1,000,000 units in 200 c.c.

13.8.46. 8 a.m. No change. Parturition imminent. Inf. 1,000,000 units in 200 c.c. Calved twins during night.

14.8.46. Slightly less inflammation in lower third of quarter but still active in upper two-thirds. About a half-pint of milky fluid was drawn from the affected quarter. The secretion from the other quarters was normal.

At the next few milkings the affected quarter continued to yield about one half-pint of a brownish milk and hope was entertained that it would resume its function to some extent. The milky fluid was gradually replaced, however, by an offensive purulent material, more inflammation developed in the gland, and on 21.8.46, *i.e.*, eight days after the last infusion the bacteriological report on the secretion was: "Numerous *C. pyogenes* and *Str. dysgalactiae*." At this time the quarter was typical of an advanced summer mastitis case which had run its natural course.

No. 178 P. An Ayrshire cow in good condition which had borne two calves. On 27.8.46 it was brought in from pasture with acute mastitis affecting the right fore-quarter. Parturition was imminent and the normal quarters contained a honey-like secretion changing to colostrum. The secretion from the affected quarter resembled fresh egg-yolk and was devoid of offensive odour. The quarter was markedly swollen and painful. There were no teat lesions. The bacteriological report on the pre-treatment sample was "*Str. dysgalactiae* in culture."

27.8.46. 10 a.m. R.F.Q. stripped and infused with 1,000,000 units penicillin in 100 c.c. water. 8 p.m. Little change. Infusion of 1,000,000 units penicillin in 100 c.c.

28.8.46. 9 a.m. Less inflammation in quarter. Little systemic disturbance. Inf. 1,000,000 units penicillin.

29.8.46. 9 a.m. Quarter considerably less changed than the usual summer mastitis case. Inf. 1,000,000 units penicillin.

1.9.46. Calved. Affected quarter shows considerable atrophy and fibrosis, but secretes a little normal milk.

6.9.46. R.F.Q. secreting appreciable quantities of normal milk. A good clinical recovery. Bacteriological report: "No growth in culture."

No. 187 P. An Ayrshire cow in good condition which had borne two calves. On 15.8.46 this animal was "springing" and brought in from pasture with acute mastitis affecting the right fore-quarter. The secretion comprised a caseo-pus in a brownish red serous fluid with a slightly offensive smell. T. 103°. Bacteriological report on pre-treatment sample: "Many cocci within the leucocytes, but no organisms appeared in culture."

15.8.46. Noon. R.F.Q. infused with 250,000 units penicillin (which was all available at that visit) in 100 c.c. water. 8 p.m. Little change. R.F.Q. Inf. 1,000,000 units penicillin in 100 c.c.

16.8.46. 10 a.m. Little change. R.F.Q. Inf. 1,000,000 units penicillin. 8 p.m. Little change. R.F.Q. Inf. 1,000,000 units penicillin.

17.8.46. R.F.Q. softer than originally and shows much less inflammatory change. The secretion is mainly serous with a few soft coagula. The penicillin injections seem to have influenced favourably the course of this case. Bacteriological report on sample: "Sterile but showing physical evidence of mastitis."

19.8.46. R.F.Q. shows more inflammatory change and the secretion is more purulent and offensive. Inf. 1,000,000 units penicillin in 100 c.c.

20.8.46. No change. R.F.Q. Inf. 1,000,000 units penicillin.

21.8.46. Quarter markedly indurated with considerable swelling of teat and ulceration around the teat meatus. Further use of penicillin deemed wasteful.

23.8.46. Calved.

26.8.46. R.F.Q. is now typical of an advanced summer mastitis case which has run its natural course. Bacteriological report: "*C. pyogenes* in large numbers."

No. 220 P. An Ayrshire cow which had borne one calf. On 18.8.46 this animal was found at pasture with acute mastitis affecting the right fore-quarter. The affected quarter was very painful and tensely swollen, with particular involvement of the teat but no lesion of the teat integument. The secretion comprised stringy coagula in a brownish-yellow serous fluid with a slightly offensive smell. There was no sign of imminent parturition. The bacteriological report on the pre-treatment sample was "*C. pyogenes* in culture."

18.8.46. 4 p.m. The R.F.Q. was stripped and infused with 1,000,000 units penicillin in 100 c.c. water.

19.8.46. 9 a.m. The R.F.Q. showed a little less inflammatory change. Inf. 1,000,000 units penicillin in 50 c.c. Little systemic disturbance. 9 p.m. No change. Infusion 1,000,000 units penicillin in 50 c.c.

20.8.46. Teat inflammation subsiding. No change in quarter. Decided not to re-infuse.

26.8.46. The quarter was now typical of a summer mastitis case which had run its natural course. Bacteriological report: "*C. pyogenes* in large numbers."

Heifer P. An Ayrshire heifer pregnant eight months with her first calf. On 29.8.46 it was brought in from pasture with acute mastitis of the right hind-quarter. The secretion was caseo-pus streaked with blood and had a highly offensive smell. The bacteriological report on the pre-treatment sample was "*C. pyogenes* in large numbers in culture."

29.8.46. 8 a.m. R.H.Q. stripped and infused with 1,000,000 units penicillin in 50 c.c.

30.8.46. 10 a.m. No change. Affected quarter infused 1,000,000 units penicillin in 50 c.c. 8 p.m. No change. R.H.Q. Inf. 1,000,000 units penicillin in 50 c.c.

31.8.46. No change. Inf. 1,000,000 units penicillin in 50 c.c.

1.9.46. No change. Decided not to re-infuse since treatment appeared to be of no avail.

This quarter became coarsely fibrosed and yielded no milk when the heifer calved in October.

Heifer L. A crossbred Friesian heifer, pregnant six months with her first calf. Affected with acute mastitis in the left fore-quarter. There was no particular involvement of the teat. Secretion comprised fibrinous masses in a straw-coloured fluid. There was no systemic disturbance but the affected quarter was acutely painful and tensely swollen. Microscopic examination of the secretion showed cocci within leucocytes and corynebacteria free in the field. There was active phagocytosis.

21.8.46. The L.F.Q. was stripped out and infused with 1,000,000 units of penicillin in 50 c.c. water.

22.8.46. Little change. Quarter infused 1,000,000 units of penicillin in 50 c.c.

23.8.46. No systemic disturbance. Inflammation subsiding. Secretion serous. Inf. 1,000,000 units penicillin. No further infusions made.

30.8.46. Quarter was now coarsely fibrosed with purulent offensive secretion. Bacteriological report: "*C. pyogenes* in large numbers."

No. 47 J. This was a yearling pedigree Friesian maiden heifer which became affected with acute mastitis in the left hind-quarter on 11.8.46. The quarter was extremely painful and tensely swollen. The inflammatory changes extended into the teat and the teat orifice was patent and showed inflammation of its lining membrane. The secretion from the affected quarter comprised brownish-yellow coagula in a similarly coloured serum; there was no disagreeable odour. It was noteworthy that the R.H.Q. was secreting a *milky-whey*. Both fore-quarters contained a whey-like fluid

Bacteriological report on pre-treatment sample: "Leucocytes packed with cocci, *Str. dysgalactiae* appeared in culture."

11.8.46. 12 noon. L.H.Q. stripped and infused with 1,000,000 units penicillin in 50 c.c. 8 p.m. No change. Acute inflammation persists. Infusion 1,000,000 units penicillin in 50 c.c.

12.8.46. 12 noon. L.H.Q. slightly less swollen. Secretion was a yellow serum Inf. 1,000,000 units penicillin. Bacteriological report: "Culture sterile."

* Parts of this report were included in a paper read before the Lancashire Veterinary Association on October 31st, 1946.

18.8.46. L.H.Q. less inflamed but quite indurated, teat less swollen. Secretion comprised a few coagula in a yellow serum with a slightly offensive smell. Bacteriological report: "One colony *Str. dysgalactiae* appeared in culture."

The acute inflammatory changes gradually subsided and were followed by atrophy and marked fibrosis without abscessation. It is considered highly unlikely that this animal, which is now pregnant, will function on the L.H.Q.

No. 19 J. A two-year-old pedigree Friesian heifer, seven months pregnant with her first calf. Found with acute mastitis affecting the L.F.Q. in the evening of 29.8.46. The quarter and teat were very painful and tensely swollen. T. 102·5°, little systemic disturbance. The secretion comprised caseous clots in a brownish-red offensive fluid and was difficult to withdraw from the teat. The bacteriological report was: "*C. pyogenes* in culture."

29.8.46. 10 p.m. L.F.Q. infused 1,000,000 units penicillin in 20 c.c.

30.8.46. 9 a.m. No change. Inf. 1,000,000 units penicillin. 8 p.m. No change. Inf. 1,000,000 units penicillin.

31.8.46. 9 a.m. No change. No further infusions.

6.9.46. Bacteriological report: "*C. pyogenes* in culture."

The quarter was now extensively fibrosed and appeared to have run its natural course.

Calved. L.F.Q. functionless.

No. 348 J. A pedigree Friesian cow in good condition, which had borne five calves. On 15.8.46 it was brought in from pasture with acute mastitis of the L.F.Q. The quarter was moderately swollen and painful. The secretion comprised large soft coagula in a non-offensive yellow serous fluid. The bacteriological report on the pre-treatment sample was: "Microscopically, an acute mastitis, but no organisms have appeared in culture."

15.8.46. The affected quarter was stripped and infused with 1,000,000 units of penicillin in 200 c.c. water.

16.8.46. The inflammatory changes had almost completely disappeared. The secretion was now thicker and custard-like. The quarter was again infused with 1,000,000 units penicillin in 200 c.c.

17.8.46. Bacteriological report: "Culture sterile." The quarter became normal to palpation and functioned well after calving.

No. 87 P. A pedigree Ayrshire cow in good condition which had borne four calves. On 26.7.46, when this cow was practically "dry," it developed acute mastitis in the R.H.Q. T. 103·5°. There was considerable swelling, heat and pain. The secretion comprised a yellow serum with large translucent clots which were difficult to milk through the teat meatus. There were no teat lesions. The bacteriological report on the pre-treatment sample was: "*Str. agalactiae* in culture."

26.7.46. 8 a.m. R.H.Q. infused with 1,000,000 units penicillin. 8 p.m. Considerable improvement. The secretion was a dense yellowish-orange fluid of creamy consistency. Inf. 1,000,000 units of penicillin in 200 c.c. Sample: "No *Str. agalactiae*."

27.7.46. 8 a.m. Improvement maintained. Secretion like thick custard. Inf. 1,000,000 units penicillin.

6.8.46. Normal whey-like "dry" secretion.

18.10.46. Immediately prior to parturition secretion was the normal honey-colostrum. Sold. A complete clinical recovery.

DISCUSSION

In considering the value of a drug for the treatment of acute mastitis in the non-lactating quarter, the various organisms concerned in the aetiology must be appreciated. While the majority of established cases show *C. pyogenes* alone in culture, our observations during recent years have shown that *early* cases of acute mastitis in the dry cow and heifer, diagnosed as "summer mastitis," do not always show this organism, but that *Str. dysgalactiae* is a frequent, early invader. Furthermore, *Str. agalactiae* or *Str. uberis* may be associated with acute mastitis in the dry cow and those affections may be indistinguishable from the *Str. dysgalactiae* cases. At other times, cocci were present on microscopical examination, but phagocytosis was active and cultural examination was negative. Mastitis associated with *Str. agalactiae* and *Str. uberis* was not followed by *C. pyogenes* infection. Similarly, not all cases of *Str. dysgalactiae* were complicated by *C. pyogenes*.

Following aetiological considerations, one has studied the course of these various infections both under natural conditions and where therapeutic agents, other than penicillin, have been employed. Unless this aspect of a disease is properly appreciated, fair appraisal of a new drug is impossible. In all acute inflammations of non-functioning quarters, in which *C. pyogenes* was present alone or with other organisms, the function of such quarters has been lost completely for all time and no drug has been found to influence this outcome. There is great variation, however, in the degree of systemic illness in the natural course of events; hence this factor is unlikely to be a satisfactory criterion of drug efficiency. In the case of uncomplicated *Str. dysgalactiae* infections, the outcome has been variable. Some quarters have been completely lost, some have made partial recoveries and others have been restored to satisfactory functional capacity. Where a recovery has followed the use of a drug, *e.g.*, sulphanilamide, it has been customary to ascribe it to that agent. In the case of acute *Str. agalactiae* and *Str. uberis* infections in the dry cow, a favourable outcome is the rule, although a measure of atrophy and fibrosis is inevitable.

Another consideration to which attention might be drawn is the bacteriology of the udder secretion during and after treatment. The ultimate clinical picture is often quite different from what one would expect to occur, according to the bacteriology of the case. For example, negative reports occurred during and after penicillin therapy in several instances. But these were frequently followed by positive reports in a few more days. (This may have been related to the presence of penicillin in the sample of secretion.) Again, acute and destructive mastitis sometimes occurs, from the secretion of which no organisms can be demonstrated in culture. Tremendous and irreparable damage may be due to the normal tissue reaction.

With the above considerations in mind, therefore, the assessment of the value of penicillin has to be approached with a great deal of circumspection.

In the cases considered in this report which were treated by penicillin infusions, all quarters which showed *C. pyogenes* in culture, alone or with other organisms, were destroyed. The impression was gained, however, that the infusion controlled, to some extent, infection with which it came in contact. For instance, inflammation in the tissue around the galactophorous sinus often regressed as compared with that in the upper portion of the gland. It is possible, on the other hand, that this effect arose from the mechanical and frequent flushing of the gland by the infusion and that a similar result might have occurred with normal saline.

Where *Str. dysgalactiae* occurred alone, one quarter recovered bacteriologically and clinically; the other was not sterilized and its function was lost. As a comparison, it is of interest here to report the case of cow No. 385 J. which became affected with acute mastitis when dry on September 6th, 1946. *Str. dysgalactiae* was isolated from the secretion. After one course of sulphanilamide, given by mouth, 4 oz., 1 oz., 1 oz., the inflammatory reaction had almost completely subsided. The cow calved and milked well on the affected quarter, which shows no gross fibrosis or atrophy.

In the one *Str. agalactiae* infection, bacteriological and clinical cure resulted following the penicillin infusion.

The conclusion drawn from this preliminary trial of penicillin therapy in relation to the future functional capacity of the quarter, was that the results did not differ materially from those which might have been expected to occur naturally, or with other mastitis remedies, *e.g.*, sulphanilamide. As regards the degree of systemic ill-health, the impression gained was that in the cases treated with penicillin this was less than usual. It has already been pointed out, however, that systemic involvement is so variable that it is not a safe criterion on which to generalize.

Summary

Ten cases of acute mastitis in dry cows and heifers were treated with penicillin.

The drug was administered by intramammary infusion in doses of 1,000,000 units, repeated from three to eight times at intervals of four to 24 hours.

Six quarters which showed *C. pyogenes* alone, or in association with cocci, were not restored to function.

Of two quarters infected by *Str. dysgalactiae* alone, one made a serviceable recovery and the other was lost.

One quarter infected by *Str. agalactiae* recovered promptly. The remaining quarter, which showed a sterile secretion throughout, made a good recovery.

It was concluded that penicillin therapy did not materially affect the outcome in these infections.

Acknowledgment.—The writer is indebted to his colleagues in the Department of Veterinary Pathology for reporting on the cultural examination of the secretions from the affected cases.

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The Treatment of C. pyogenes Mastitis with Penicillin

By

K. D. DOWNHAM, G. J. CHRISTIE and D. L. HUGHES

Veterinary Science Division, Research Department, Boots Pure Drug Co. Ltd., Thurgarton, Notts.

Inflammation of the cow's udder caused by *C. pyogenes* has long been recognized as one of the most serious types of mastitis. The gross accumulation of pus in the affected quarter and the destruction of secretory tissue almost invariably result in the loss of the quarter. In a proportion of cases the local symptoms are accompanied by a general toxaemic reaction which may cause the death of the animal. The incidence of the disease is extremely variable. The common name of summer mastitis indicates that the majority of cases occur in the months of July, August and September, but the number of cases varies from year to year. The condition is also very localized, some districts appear to be free of the disease whereas others may suffer severely. In fact, the disease may be localized to particular farms or even fields. There seems to be some relationship to weather and the density of fly population. However, these conditions in relation to *C. pyogenes* infection of the cow's udder need to be much more accurately defined. The reason for the infection occurring most frequently in dry cows and heifers has yet to be determined.

The disease is a major hazard in some dairying districts and in view of its serious effects on the individual cow it must be regarded as of considerable economic importance to the dairying industry.

It is generally agreed that *C. pyogenes* mastitis is the most intractable type of mastitis to treat, Campbell (1941) states: "Treatment is not satisfactory. In this respect a measure of our non-success is the frequency with which farmers send their cows to the slaughterhouse as soon as they recognize the symptoms."

Treatment has been most varied, ranging from the administration of formalin per os to drastic surgical intervention in the affected quarter, usually amputation of the teat to facilitate drainage.

In 1940 favourable reports on the administration of sulphapyridine (M. & B. 693) by the mouth in doses of 50 to 75 grammes followed by 25 grammes twice daily for three days were reported by Thompson in Northern Ireland.

One of us (K. D.) has found sodium sulphapyridine in solution administered intravenously to be of value in the treatment of the generalized symptoms, but no favourable effect was observed on the local condition in the udder.

It appears to be the general opinion that although this treatment is of value in arresting systemic symptoms it does not usually arrest the local inflammation and tissue destruction in the udder (Watts, 1943; Arthur, 1943; Roach, 1945).

Brown & Stuart (1943) described the treatment of 13 cases of *C. pyogenes* mastitis with *C. pyogenes* toxoid. They found that this treatment considerably improved the general condition of the cows, the udder secretion became more fluid, and the lameness due to swollen hocks disappeared within two days. Affected quarters showed less tendency to rupture, but no quarters recovered sufficiently for subsequent lactation.

In view of these findings it was hoped that penicillin therapy by direct infusion of the udder might succeed in saving *C. pyogenes*-infected quarters. The only record we have seen of penicillin treatment of *C. pyogenes* mastitis is by Edwards & Brownlee (1946). They treated four cases with negative results. However, it was felt that a more extended trial of this form of therapy was justified.

A considerable number of *C. pyogenes* mastitis cases occurred in this area (N.E. Midlands) during the latter half of the summer and we have had the opportunity of treating eleven cows. Four animals were in herds under our direct control and they were under continuous observation, and seven cows were referred to us through the courtesy of Captain Godber, M.R.C.V.S., and Mr. F. T. Williams, M.R.C.V.S.

Methods

Diagnosis.—Secretion from each quarter was plated on to the surface of blood agar containing aesculin but no crystal violet. A diagnosis of *C. pyogenes* was based on isolating Gram positive diphtheroids or coccobacilli appearing as tiny pinpoint colonies after 48 hours' incubation. Subcultures were required to peptonize litmus milk and liquefy solid serum slopes.

Treatment.—Penicillin was administered by udder infusion as described by Downham & Christie (1946). The required unitage per quarter was dissolved in 100 ml. of sterile distilled water. Occasionally it was not possible to infuse 100 ml. and the total was reduced to 50 ml. Owing to the unfavourable results obtained no set system of dosage was adhered to as each case had to be treated on its merits.

In certain cases ancillary treatment was also undertaken to combat fever, constipation, etc. In two cows, D.H. and B.27, sulphonamide drugs were also employed. However, the results are regarded in the main as a straight test of penicillin therapy in this type of mastitis.

A summarized statement of the results is given in Table I. The treatment of each cow cannot be given in detail owing to considerations of space, and although there were considerable differences in dosage of penicillin and intervals of administration, none of these variations apparently influenced the final results.

It will be noticed that in three cows, A.M., H., and B.27, *Str. dysgalactiae* infection of the udder was also present. This association was found in another cow, treated with a different antibiotic, which is not included in the present series. In cows H. and B.27 the infection with *Str. dysgalactiae* preceded the infection of the same quarters with *C. pyogenes*. In cow A.M., the infection with *Str. dysgalactiae* was in the RH which showed no abnormality; *C. pyogenes* was present in the abnormal RF. In the fourth cow, not included in this series, the two infections were concomitant in the affected quarters although *C. pyogenes* finally superseded *Str. dysgalactiae*. Wright (1946) has drawn attention to this associated infection. The number of cows with this dual infection in this series is too small to warrant any conclusions as to its significance.

Table I

Treatment of *C. pyogenes* Mastitis by Penicillin Infusions

Cow	Clinical symptoms	Bacteriology	Treatment	Result
D.H.	5.7.46. Dry. Thick pus and clots L.H. No constitutional illness.	*C. pyogenes* in L.H.	11.7.46. 100,000 units penicillin in each quarter four times on two successive days. 16.7.46. 50 ml. 30% sulphathiazole per quarter twice. 18.7.46. 100,000 units penicillin in each quarter once.	9.10.46. L.H. still enlarged and hard. Quarter ruptured. General condition good.
K.B.	22.7.46. Dry. Acute purulent mastitis in R.F. Secretion: foul-smelling blood-stained pus. General systemic illness, 24 hours' duration.	*C. pyogenes* in R.F. *S. Staph. pyogenes* in R.H. and L.H.	16 mega units penicillin by infusion over a period of three weeks. R.F. received an average of 734,000 units every 1½ days.	24.8.46. Little clinical improvement. R.F. still discharging pus which contained *C. pyogenes*.
A.M.	22.7.46. Dry. Acute purulent mastitis in R.F. which discharged a foul blood-stained pus and clots. General systemic illness.	*C. pyogenes* in R.F. *Str. dysgalactiae* in R.H. *Staph. pyogenes* in L.H.	15 mega units penicillin by infusion over a period of three weeks. R.F. received an average of 496,000 units every 1½ days.	28.8.46. Considerable clinical improvement, but R.F. still discharging pus containing *C. pyogenes*.
S.C.	24.7.46. Dry. L.F. enlarged, very hard. Teat swollen, only a little blood-stained pus could be removed. Had only been abnormal 24 hours. Slight systemic upset.	*C. pyogenes* in L.F.	24.7.46. 100,000 units penicillin in L.F. only on two successive days.	4.10.46. L.F. burst at two points discharging pus. General condition good.
D.	31.7.46. Dry. Enlarged hard R.F. containing thick pus. No constitutional disturbance.	*C. pyogenes* in R.F.	31.7.46. 100,000 units twice in 24 hours.	9.10.46. Good condition. R.F. still enlarged and hard.
N.S.D. 3	3.8.46. Dry. L.F. very enlarged and hard containing foul green pus. R.F. a few clots. No swelling. Inappetence.	*C. pyogenes* in L.F. Nil in R.F.	3.8.46. 100,000 units once in R.F. 3.8.46. 100,000 units three times in three days.	Calved 23.10.46. R.F. enlarged and painful, teat was blind. Good condition.
N.S.A. III.	3.8.46. Dry. Hard R.F. developed on 30.7.46. R.F. hard and enlarged. A clear mucous secretion with whitish - yellow clots.	*C. pyogenes* in R.F.	3.8.46. 100,000 units in R.F. only. 5.8.46. 100,000 units on R.F. only	Calved 20.8.46. R.F. some normal milk becoming thin, watery and clear. Good condition.
B.B.	5.8.46. Enlarged hard R.F. and R.H., both quarters contained pus. Cow acutely ill. Swollen hocks and ? laminitis developed on 14.8.46	*C. pyogenes* in R.F. and R.H.	An average of 150,000 units per infected quarter every day for 22 days; ten injections of 100,000 units intramuscularly in same period.	23.9.46. Poor condition. Both fore quarters still enlarged containing pus.
H.	12.8.46. Hard L.F. Blood - stained fluid with clots. Recumbent.	R.F. *Str. dysgalactiae* L.F. *Str. dysgalactiae*	12.8.46 – 22.8.46. 2·8 mega units by infusion and 700,000 units intramuscularly. An average of 350,000 units daily. 26.8.46. 1·6 mega units by infusion in four infusions.	9.10.46. R.F. and L.F. hard and stonelike. L.F. had a discharging fistula. General condition: thin but lively.
A.B.	15.8.46. Mastitis suspected since 4.8.46. Calved 6.8.46. Poor condition. Respirations slightly increased. Both quarters enlarged and contaminated; foul-smelling pus. Clots in R.H.	R.F. *C. pyogenes*. R.H. *C. pyogenes*. L.F. *C. pyogenes*. L.H. *C. pyogenes*. • • Apparently normal secretion.	16.8.46. 100,000 units intramuscularly every three hours × 6. 17.8.46. 100,000 units intramuscularly every four hours × 4. 16.8.46. Nine infusions of 100,000 units per quarter in 12 days.	4.9.46. Pus in R.F. and L.F. Clots R.H. Systemic condition little change.

B.27	16.10.46. Freshly calved. Both fore quarters enlarged and hard. Secretion — brownish liquid with many waxy yellow clots. Recumbent. Inappetence.	R.F. *Str. dysgalactiae.* L.F. *Str. dysgalactiae.* R.H. *Str. dysgalactiae* L.F. — R.F. *C. pyogenes.*	16.10.46. 25,000 units penicillin per quarter. 18.10.46. 500,000 units penicillin per quarter. 21.10.46. 100,000 units penicillin per quarter.	31.10.46. Both fore quarters enlarged and hard, containing pus. General condition better.	
	24.10.46. L.F. and R.F. hard and enlarged. Secretion purulent. General condition poor.	L.F. *C. pyogenes.* R.H. — L.H. —	24.10.46. 100,000 units penicillin per quarter. 25.10.46. 3 ozs sulphapyridine followed by 1 oz. × six times in 48 hours.		

Discussion

The clinical course of *C. pyogenes* mastitis may vary considerably. In some animals, particularly heifers, there may be little constitutional disturbance, in others the toxaemia may be so great as to cause death, but in all animals the local condition is an intense purulent inflammation resulting in the loss of the quarter. Any evaluation of treatment must be measured against these two effects. Great caution is necessary before ascribing any clinical improvement as due to a particular form of treatment.

However, in one or two of the cows treated, it is probable that a fatal outcome was avoided by the use of penicillin. Some of the animals received intensive treatment with relatively enormous doses of penicillin—14 to 16 mega units in a space of three weeks—and these animals benefited as far as their general clinical condition was concerned; but such dosage would be impracticable and uneconomic under ordinary conditions, and it was without effect on the course of events in the udder. It should be pointed out that in six of the cows, treatment with penicillin had commenced within 24 hours of the first signs of abnormality in the udder. These cows fared no better than those animals which received treatment later.

It was noticed in some animals that frequent infusion tended to soften the udder at the base of the teat and in the region of the gland sinus, and in certain cases the pus became somewhat more fluid, but the condition in the rest of the gland was unchanged.

It is of interest to note that *in vitro* penicillin sensitivity tests with many of the strains of *C. pyogenes* obtained from these cases showed that all the strains examined were more sensitive to penicillin than the usual sensitive control Oxford staphylococcus (Hughes & Farmer). It appears that the problem of treating *C. pyogenes* mastitis is not so much the search for a suitable therapeutic agent as devising some means of ensuring that the drug of choice penetrates the wall of thick pus and inflammatory debris to reach all the affected portions of the gland.

Summary

Penicillin therapy by udder infusion in eleven cases of *C. pyogenes* mastitis failed to effect any marked improvement in the local inflammation of the mammary gland. It is considered that intensive penicillin therapy may have been of value in combating the general systemic affects of the local udder infection.

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Weekly Wisdom

We sometimes spoke as if our civilization was so stable that it would necessarily endure. But there were 20 or 30 civilizations beneath the sands of the Middle East or on the shores of the Mediterranean, and our civilization might join that pathetic and tragic wreckage.—The Archbishop of York (Lords' debate on control of atomic energy).

* * * * *

A recent census of livestock on Guernsey shows that cows have increased from 2,085 to 2,126 over last year, bulls from 125 to 183, heifers from 1,105 to 1,305, and pigs have decreased from 1,156 to 711.

NEW INSTRUMENTS AND APPLIANCES

[The Editorial Committee desires to make this Section a regular feature of *The Veterinary Record* and would welcome contributions accordingly. Their publication, however, carries no implication that the instrument or appliance concerned is necessarily recommended by the Committee.]

* * * * *

A New Type of Teat Instrument

By

REG. W. HALL, M.R.C.V.S.
Barry

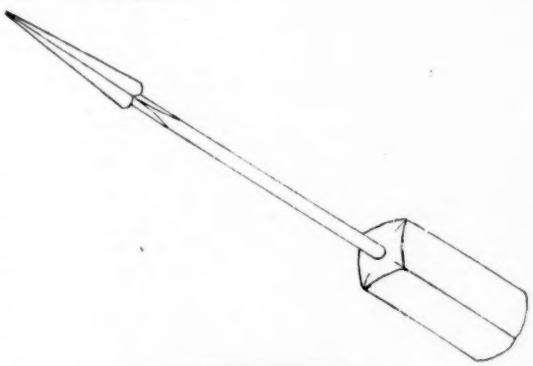
I have devised this instrument for the purpose of operating upon complete and partially obstructed teat orifices.

It is comprised essentially of three tapering razor-edged blades radiating equidistant from a central stem. The stem is prolonged a short distance beyond the termination of the blades to allow of insertion into the teat orifice. (See sketch below.) The instrument is 4½ inches long.

The instrument has been found to have the following advantages:—

(1) Three incisions of equal depth are made with a single insertion of the instrument, thus eliminating dropping of the segments of the incised teat end below the orifice.

(2) The operation, in the majority of cases, allows an even flow of milk without spray.



H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
Agriculture and Fisheries, Ministry of:		
Bulletin No. 121. Cultivation of Medicinal Plants. June, 1942. Revised, March, 1947. (24-204-21-47*).	0 6	0 7
Miscellaneous Publications (*Not Published by H.M. Stationery Office but on sale at the Sale Offices for the Convenience of the Public*):		
United Nations:		
Estimated World Requirements of Dangerous Drugs in 1947. Statement issued by the Supervisory Body under Article 5 of the Convention of July 13th, 1931, for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs. (Document E/DSB/3.) December 15th, 1946. (88-3542)	1 6	1 8

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An election to the Henry George Plimmer Fellowship will take place in July, 1947. Applications (by letter only) must be made to the Registrar of the Imperial College of Science and Technology, South Kensington, S.W.7, on or before June 1st, 1947. The Fellowship (present annual value approximately £217 p.a.) is tenable at a recognized institution at home or abroad, and the subject of research may include morbid anatomy, histological anatomy, chemical pathology, protozoology, bacteriology and allied subjects in either zoology, medicine or botany.

ABSTRACTS

[Some Observations on Nerve Regeneration in the Udder. Espe, D. (1947.) *Dairy Sci.* **30**. 9-12. (1 fig., 1 table.).]

The author gives an account of an experiment on a calf in which an udder transplant was made at the age of six weeks in order to destroy all nerve pathways to the glands. The glands were dissected free of the body except for one external pudic artery. The udder was then turned around so that the rear teats faced anteriorly and the udder was then sewn back into place. When healing was complete, the right external pudic artery, previously left intact, was ligated. When her first calf was born the subject showed normal development of her mammary tissue although the appearance of the udder was "most unusual." One gland gave no milk, due to mastitis, but the other three gave 23½ lb. per day, measured by weighing the calves which were suckling the cow, before and after each feed. The right half of the udder was found to be devoid of sensory nerve supply, but the left half had such a supply, due probably to nerve regeneration. The author then attempted to investigate the "letting down" of the milk in the part of the udder devoid of sensory nerves by attaching a single cup milking machine to the teat before the calf had suckled. In spite of the lack of sensory supply 1¼ lb. of milk were obtained in four minutes as compared with 3·2 lb. from the other side. This, it is suggested, was due to the emptying of the udder providing a certain indirect stimulus. The author considers that his findings help to confirm the theory of Ely & Petersen (1946) (*J. Dairy Sci.* **29**. 211) that the process of letting down is due to a combined nerve-endocrine mechanism, sensory stimuli causing a release of oxytocin which in turn acts on the smooth muscle of the udder.

J. W. D.

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[Haemophilia in a Family of Dogs. Field, R. A., & Rickard, C. G. (1946.) *Cornell Vet.* **36**. 285-300.]

In a certain family of dogs, some of the male puppies from litters with identical or related ancestry showed a tendency to bleed excessively. Ligature of the umbilical cord was often required to prevent fatal haemorrhage at birth, while at from six to 12 weeks of age the dogs developed haemorrhages into the joints, under the skin, and elsewhere. Many of the affected pups succumbed from persistent and uncontrollable haemorrhage following wounds or blood-vessel ruptures sustained in normal play. One puppy bled profusely from the gum in the normal process of dental eruption and had to be destroyed. Another dog showed complete posterior paralysis due to haemorrhage into the lumbar spinal cord; it then developed decubital ulcers, which occasionally bled profusely, and finally it died from haemorrhage when a small incision was made in its lip to get blood for examination. Sometimes the joint and other haemorrhages regressed.

Blood examinations showed that the dogs were affected with haemophilia: there was a prolonged coagulation time, which was not due to a deficiency of prothrombin or of fibrinogen, nor to a decrease in the number of platelets, but to lack of available thrombokinase. The incidence of the condition showed that it was due to a sex-linked recessive character, as is the case with human haemophilia (the haemophilic condition recently reported in a family of swine in America is due to an autosomal retessive character).

The elimination of the defect from the kennels concerned is being carried out. Haemophilic males appear to be self-eliminating, as they do not reach the age of mating before showing the condition, and their normal brothers can be used for mating without risk. Heterozygous females, carrying the defect, cannot so far be distinguished from their homozygous normal sisters except by a breeding test. If a suspected female is mated to any male at all, seven or eight sons should be sufficient to give evidence whether or not she is a carrier: the chance that the condition will not show in any one son is one in two, and the probabilities that it will not show in six, seven or eight sons are $1/64(2^6)$, $1/128(2^7)$, and $1/256(2^8)$ respectively. If such breeding tests are not made, it will be sufficient to avoid breeding from all sisters of haemophilic males, and from all daughters of proven carriers.

E. C.

* * * * *

[Normal Eye Colour in the Chicken. Nelson, N. M. (1947.) *Poultry Sci.* **26**. 61-66.]

Eye colour in fowls is due to a blending of several pigments, namely haemoglobin and carotenoid (which when combined give the reddish-bay iris), and also melanin, which in conjunction with the other two gives the brown iris. Melanin is a permanent pigment, but the other two vary a great deal in amount with physiological change.

The red pigment (haemoglobin) is confined to the vascular system of the iris. It varies in such conditions as inflammation, trauma and anaemia. The diameter of the blood vessels in the iris appears to be a hereditary character.

The yellow pigment factor (carotenoid) is alcohol-soluble and is composed of carotene and xanthophyll. It occurs in branching connective tissue cells in some breeds, but in others such as the Dorking and Orpington the muscle fibres themselves bear the pigment. The yellow colour of the iris is affected by egg production, genetic variation, and pathological conditions such as lymphomatosis. Certain diets inhibit the deposition of carotenoid pigments. Cornish and Malay fowls have a pearl-grey iris, devoid of any gross colouring.

Black pigment (melanin) is controlled by a genetic factor. It is obvious, therefore, that variations of iris colour are not due to any one factor, and that the poultryman's practice of culling all birds with grey eyes is undesirable unless other symptoms suggesting lymphomatosis are present.

J. G. C.

REVIEWS

["The Milch Cow in England—a Plea for Constructive Breeding." By E. R. Cochrane. Published by Faber and Faber in 1946. Price 16s. net.]

Miss Cochrane is a practical breeder who has striven, not unsuccessfully, to build up her own dairy herd upon lines which are more in accordance with scientific thought and principles than those which are followed by certain other breeders at the present time. It is early evident that the authoress subscribes to the principle of making selections upon performance and behaviour rather than purely upon pedigree. She makes an entirely honest approach to a subject which is still, unfortunately, clouded to some extent with prejudice and tradition, and tends perhaps to be regarded as the prerogative of those enly who possess (or who think they possess) the "art" of breeding dairy cows. One of the striking characteristics of the book is Miss Cochrane's capacity for ridicule and gentle satire on some of the worn-out clichés which are still all too common in the conversation of breeders. She rightly points out that an abundance of sonorous and high-sounding ancestral names in the pedigree of a given cow is no guarantee that it is a well-bred cow, and that its performance will be above average. She goes so far as to say that only a proportion of the pedigree herds are well-bred, and that some non-pedigree herds are far better bred than some of the highly-pedigreed ones. She has every respect for the breeder who is genuinely trying not only to establish excellency throughout his own herd, but also to contribute something worth while to the cattle of the country. On the other hand, she has but little time for the owner who maintains a collection of cows, or a flying herd, and is not interested in the breeding and improvement of his dairy stock.

Throughout the book the authoress draws upon her own experiences, and freely and frankly admits her mistakes and her early ignorance, and traces the change that occurred in her herd after, as she puts it, she gave up other hobbies and assumed the duty of keeping the records of her cows herself and thereby became an amateur breeder. Many people in her position might have been content to trust in the luck of the game of breeding to acquire a few prizes and to receive a few plaudits. Instead of this, she brought to her task a fundamental honesty of purpose and a highly critical approach which deserves the highest respect. Time and again she pricks the bubble of dishonesty which everyone familiar with cattle sales must recognise as one of the traditional attributes of those who wish to effect a good sale. She agrees, and we agree with her, that it seems difficult to be completely honest in breeding cattle for sale, though doubtless the great majority of breeders are not actively dishonest, preferring to shelter under the legal maxim *caveat emptor*.

The book is difficult to review in any concise fashion, since it contains a wealth of information, much highly critical argument (with perhaps not all of which the reader can agree), and sound logic, which can only be appreciated by careful reading. She claims to have three objects; firstly, to encourage discussion amongst farmers and breeders; secondly, to assist the inexperienced to avoid some of the pits into which she stumbled, and thirdly, to put forward a number of constructive suggestions. There is little doubt that she has already achieved the first of these objectives, and discussion has at times, to say the least, been active. She should in the course of time achieve her second

objective, for we understand the book is having a ready sale amongst younger breeders and students, who are perhaps less tolerant of established beliefs of the past than were their fathers; and the constructive suggestions she puts forward are undoubtedly worthy of the most careful consideration.

It seems to us that it was high time this book was written, for while not agreeing, perhaps, with all of it, there is undoubtedly much in it which ought to be said, and some of it which should have been said many years ago. In spite of what many regard as a flourishing export trade for pedigree stock, there have been signs for some time past that British stock-breeders will be compelled to move with the times if they hope to retain and increase the active interest of breeders and potential purchasers in the vigorous overseas cattle-raising countries.

We can thoroughly recommend Miss Cochrane's book to all those of our readers who take an interest in the breeding of dairy cows—and this should be the majority of our members—for the greater and greater interest which is being taken by stock-owners in the scientific principles of breeding requires that the veterinarian should keep himself abreast of current thought and be able to discuss with and advise his clients on sound and practical lines.

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["Roche in War-time." (Roche Products Limited, Welwyn Garden City, Herts.)]

An impressive, largely pictorial, record of production achievement, under war-time dangers and conditions, on the part of this well-known member of the British Fine Chemical Industry group. A few copies are available to our readers on application.

QUESTIONS IN PARLIAMENT

Fowl Pest

Lord Willoughby de Eresby asked the Minister of Agriculture how many cases of fowl pest have been notified to his Department; how many fowls have been ordered to be slaughtered; how much has been paid out by way of compensation; and what steps are being taken to prevent the further spread of this disease.

Sir John Barlow asked the Minister of Agriculture how many cases of fowl pest there have been recently; how many suspected cases; and what steps he is taking to prevent further outbreaks.

Mr. T. Williams: The number of outbreaks of fowl pest confirmed up to May 2nd is 147. In addition, 160 suspected cases have, on investigation, proved to be negative. About 16,000 birds have been slaughtered at an approximate cost in compensation of £12,000. Since the most likely source of infection is the feeding of uncooked poultry waste, I am making it obligatory for all poultry-keepers to boil such materials before allowing their birds to have access to them. The importation of live birds and hatching eggs from countries in which fowl pest is prevalent is not being permitted, and officers of my Department and of the Ministry of Food are examining the possibilities of minimizing the risk arising through the importation of dead poultry.

Lord Willoughby de Eresby asked the Minister of Food whether, in view of the recent serious outbreak of fowl pest in the United Kingdom, he will arrange with the exporting countries of dead poultry to the United Kingdom to export in future dressed and not undressed fowls, so as to prevent the further infection of home poultry stock.

Mr. John Morrison asked the Minister of Food what is the total of undressed poultry imported from the United States since the New Year; and what precautions are taken against these dead birds bringing in poultry pest.

Dr. Summerskill: About 1,500 tons of undressed poultry have been imported from the United States this year. Officers of my Department and of the Ministry of Agriculture are examining measures to minimize the risk of fowl pest being brought into the country through the medium of imported poultry and the noble Lord's suggestion will certainly be taken into account.

Lord Willoughby de Eresby: In view of the serious figures given by the Minister of Agriculture about these recent outbreaks, will the hon. Lady see that not only do we prevent undressed fowls from coming into the country, but also that their heads are cut off before they come into the country?

Dr. Summerskill: No, Sir, I cannot promise that. We do not want to prohibit poultry from being imported into this country. I think the noble Lord is wrong about the heads, and that infection is due to the fact that the poultry offal is unsterilized and is then used as swill.

Major Sir Thomas Dugdale: Is the hon. Lady aware that if drastic action is not taken, and the pest is allowed to continue, there will be few eggs and poultry from home producers?

Dr. Summerskill: We are aware of the seriousness of the matter.

Lord Willoughby de Eresby: Does the hon. Lady realize that in one instance the infection has been definitely traced to a head having been thrown down and a fowl having picked it up and contracted this disease? In view of the fact that 10,000 home birds have had to be slaughtered as a result of this pest, does not the hon. Lady think it better not to import fowls in the numbers in which they are being imported?

Mr. Baker White: Is the hon. Lady aware that this disease is prevalent also in countries in Eastern Europe from which we are increasing our poultry imports?

Mr. De la Bere: In view of the unsatisfactory nature of the replies of the Minister of Agriculture and the Parliamentary Secretary to the Ministry of Food on this question, I shall raise this matter on the Adjournment. It is thoroughly unsatisfactory.

* * * * *

Hides (Warble Fly Damage)

Lieut.-Colonel Sir Thomas Moore asked the Minister of Food how many hides were damaged or rendered unfit for tanning, due to the warble fly, for the quarter ended March 31st, 1937.

Dr. Summerskill: Of the 255,000 hides produced in the Ministry's slaughterhouses in Great Britain during the 13 weeks ended March 28th, 1947, about 53,000 had been damaged by the warble fly. None of these hides was unfit for tanning, but the leather produced from them would be reduced in value by the presence of warble holes.

Sir T. Moore: In view of the great loss in beef and, of course, of leather, does not the hon. Lady agree that something should be done very quickly to counteract the effect of this pest?

Dr. Summerskill: I am advised that there is no loss in beef. The only trouble is the deterioration of the hide, and my right hon. Friend the Minister of Agriculture, who is very concerned in this matter, is giving it his careful attention.

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Research (Cost)

Mr. Philips Price asked the Financial Secretary to the Treasury whether he will make a statement setting out the present approximate expenditure of the Government directly and indirectly on scientific research and development work in this country, including medical, agricultural, industrial and defence research.

Mr. Glenvil Hall: The estimates for 1947-48 provide for expenditure on research of all kinds of about £68,000,000. In addition, a substantial part of the grant of nearly £12,000,000 to universities is spent on research.

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Animal Feeding-Stuffs

Lieut.-Colonel Bromley-Davenport asked the Minister of Food whether, in view of the misunderstanding which exists as to the ability or otherwise of this country to obtain a greater share of the world production of animal feeding-stuffs, he will appoint an independent committee, comprising representatives of the farming community in this country, to investigate and report on the present position.

Dr. Summerskill: No, Sir. I am satisfied this country is already obtaining as large a share as possible of the various types of animal feeding-stuffs entering into international trade.

ANOTHER "STERKFONTEIN SKULL"

The Johannesburg Correspondent of *The Times* reports that Dr. Robert Broom, of the Transvaal Museum, has made a statement to the *Rand Daily Mail* in connection with his recent discovery of a "Sterkfontein skull" in the Sterkfontein caves near Krugersdorp. Dr. Broom says that it will show more definitely than ever before that man was very closely related to the ape. The skull, that of a woman and about the same age as the skull of the "Sterkfontein man" which Dr. Broom found in 1936, is, he says, the most valuable of its kind recovered in history. Though it is embedded in rock it is all in one piece.

* * * * *

Ten cattle belonging to Mr. C. Fargher, of Great Meadow Farm, Isle of Man, died a short while after eating mangolds which it is thought must have been affected by bad weather conditions.—*Farmer and Stock-Breeder.*

East African Central Veterinary Research Institute

Dr. E . G. White Appointed Director

The Colonial Office authorizes us to announce the appointment of Dr. Edwin George White, PH.D. (LOND.), B.SC. (VET. SC.), B.SC. (PHYSIOL.) (LOND.), M.R.C.V.S., as the first Director of the East African Central Veterinary Research Institute, Kabete, Kenya Colony. We understand that Dr. White takes up his appointment in August.

Shortly before the outbreak of war it had been decided that a central research station should be commenced for the study of veterinary problems in East Africa. Arrangements were in hand to obtain the necessary staff, but the outbreak of war necessitated the postponement of much of the envisaged work and rendered impossible the filling of staff appointments.

The project is now to be renewed and the research will be carried out at the Institute at Kabete which, in the past, has been used for Kenya veterinary research. At this station problems common to all the East African territories will be investigated; the Institute is to serve as the centre for fundamental research in veterinary science in East Africa, covering Kenya, Tanganyika and Uganda. This is in addition to the research work carried out at the various laboratories in the three colonies coming within the administration of the Directors of Veterinary Services. The Institute will also play a part in the training of African veterinarians and in providing research training for European veterinary graduates who join the Colonial Service in East Africa.

Attempts are now being made to fill the many vacancies in the scientific staff of the Institute, to the Directorship of which Dr. White has now been appointed.

DR. WHITE'S CAREER

Dr. White entered the Royal Veterinary College in October, 1928, with a Clement Stephenson Entrance Scholarship and a grant from the Kitchener Memorial Fund. During his four years at the College he was awarded 20 first prizes. He acted for two years as Student Demonstrator in Physiology and Histology and was awarded the second Fitzwygram Prize in 1932, when he graduated M.R.C.V.S., graduating B.Sc. (Veterinary Science), London, in December of that year. From 1932 to 1935 he held a Studentship for Research in Animal Health, devoting the first 18 months to taking the B.Sc. degree in Physiology at University College, London, and graduating with first-class honours in June, 1934. The remainder of the time was spent studying pathology in Germany, first under the late Professor Ludwig Aschoff in Freiburg (Breisgau) and then under the late Professor Karl Nieberle in the Veterinary Faculty at Leipzig.

In October, 1935, he was appointed Lecturer in Pathology at the Royal Veterinary College and Assistant in Pathology in the Research Institute under Dr. F. C. Minett. In 1939 came promotion to Reader in Pathology and Senior Assistant in the Research Institute. This post was held until July, 1946, when he transferred to the Rowett Institute, Bucksburn, Aberdeenshire, at the invitation of the Director, Dr. D. P. Cuthbertson.

In October, 1941, Dr. White was awarded the degree of Ph.D. of the University of London for a series of publications dealing with the structure of the liver of the pig in health and disease.

In July, 1943, he took temporary charge of the Department of Physiology and Biochemistry at the Royal Veterinary College, returning to the Research Institute in July, 1944.

In November, 1945, he visited Germany and Austria, in company with Dr. A. W. Stableforth, in order to ascertain the state of veterinary research in these countries and the contributions made during the war years. The visit was made under the aegis of the Control Commission for Germany and the findings were published by H.M.S.O. as "B.I.O.S. Final Report No. 483."

The period of nine months at the Rowett Institute has been spent in building a section of Histology and in carrying out some investigations on the relation of nutrition to parasitic infestation in animals.

Dr. White has been a member of the Pathological Society of Great Britain and Ireland since 1936, and for a similar period a Fellow of the Royal Society of Medicine, of the Comparative Section of which he has been a member of Council, and the Section's Editorial Representative. He was Vice-President in 1945, and is a representative of the Comparative Section on the Museum Committee of the Royal College of Surgeons of England.

From 1942 to 1946 Dr. White rendered the N.V.M.A. valuable service as a member of the Editorial Committee of *The Veterinary Record*. He has been a member of the Veterinary Research Club since 1937.

In 1936 Dr. White married Miss Grace Adlington who during 1931-34 was also studying at University College, London, taking the B.Sc. (General) and B.Sc. (Physics) at the time he was taking the degree in Physiology. During the war, when the Royal Veterinary College was evacuated to Streatley, Mrs. White worked for two years in the Department of Preventive Medicine. They are the happy possessors of three little girls.

Veterinary Affairs in Kenya

[FROM OUR OWN CORRESPONDENT*]

Dear Mr. Editor,

I have purposely delayed sending you further news from Kenya, owing to a number of important events due to occur this month.

Appointments

First of all, I have to tell you of the appointment of Mr. E. Beaumont as Director of Veterinary Services, Kenya; he took charge of the department on his return from leave last November. The new Director is well known in Kenya and the appointment is a popular one. Members of the department feel that they have not only gained a new departmental head, but also a real friend in high quarters. I express the feelings of all of us, when I wish him all happiness and success during his term of office.

Another welcome appointment is that of Dr. E. B. Worthington, as Scientific Secretary to the East African Conference of Governors. It will be his duty to co-ordinate scientific research services throughout the territories. Dr. Worthington is well known here for his work on the fisheries of the Central African lakes and his appointment is undoubtedly a very wise one. He has only recently arrived, but there is already an indefinable sense that some new activity is stirring.

We have also been told that an appointment to the Directorship of the Central Veterinary Research Institute may shortly be expected. This appointment is long overdue and we sincerely hope that this report is correct.† Certainly, some progress is being made. Original plans have been modified, so as to make them acceptable to all three territories. Uganda and Tanganyika have always been suspicious that the Institute would be used largely for the benefit of Kenya and that their contributions to its funds would be in the main an indirect subsidy of the Kenya farmer. The new plan envisages the creation of an East African Veterinary Research Organization of which the Central Research Institute would be the pivot and the brains. In case of need or advantage, staff would be detached for work at other laboratories within East Africa. Meanwhile, the Kenya Veterinary Department will retain its own diagnostic laboratory under departmental control. It is thought that there are now adequate safeguards to satisfy the very reasonable fears expressed by Uganda and Tanganyika and the modified scheme will shortly go forward to the Secretary of State, together with a request for the necessary funds for capital expenditure, estimated to be £250,000.

The arrival of the Director of the Central Research Institute will, I regret to say, precede the departure of Mr. Hudson on retirement. Mr. Hudson, after more than 20 years' service, is unrivalled in his experience of Veterinary Research in East Africa and his departure will create a gap that cannot easily be filled. In recent years, he has been forced to give much of his time to administrative work and there is no doubt that East Africa through this has suffered a direct and serious loss. Our good wishes to him and Mrs. Hudson will include the hope that he may now be able to fulfil his wish to return to the research work that is his main interest.

The matters that I have reported have to a certain extent restored confidence in professional circles in Kenya. Furthermore, a Commission to examine the question of salary scales has been appointed and is due to arrive in East Africa in March. It is hoped that as a result of its report anomalies detrimental to the profession will be removed. Departmental members feel especially aggrieved that in the newer salary scales officers must wait for five years at the £840 level, before they can proceed by increments to £1,000. No other professional or administrative officers are halted in this way and this is both invidious and a real hardship, since owing to the length of the veterinary training our men usually join the service at a more advanced age than that of other personnel. Some questions have been asked about this in Kenya Legislative Council, but the replies by Government have been unsatisfactory and misleading.

* Appointed at the invitation of the N.V.M.A., by the Kenya Veterinary Medical Association (Affiliated Division).

† The appointment of Dr. E. G. White as Director is announced in the adjoining column.—*Editor.*

Inauguration of East African Branch

Our new East African Branch of the N.V.M.A. held its first meeting at Kabete on February 15th and 16th. The Branch is to be called the "Veterinary Association of Eastern Africa." This wording has been adopted, so as not to imply that it is exclusive to the true East African territories. We hope that the Sudan will join us and possibly also Nyasaland and Northern Rhodesia. The meeting was well attended and the following members from outside Kenya were present:—

Mr. Cronly of Uganda, Messrs. Lowe, Wilde and Pevie from Tanganyika, Mr. Evans of the Sudan, Major Pearson of Somalia, and Major Leach from Eritrea.

You will receive the minutes from the Secretary; I should, however, like to mention two points. Firstly, agreement was reached on action to be taken over the visit of the East Africa Salaries Commission, by which we hope the position of the profession here will be placed on a satisfactory footing. Secondly, concern was expressed over recruitment. The meeting expressed confidence in the future of the Colonial Veterinary Service, once our present difficulties had been overcome, and wished to encourage recruitment by suitable means. There was, however, a general feeling that some young men who were recruited found conditions very different from what they expected, and a proportion wished to resign after one tour of service. To-day new recruits were often men who had seen some years of active service and had in many cases got married; they naturally wished to settle comfortably and had lost their taste for adventure and for roughing it. The meeting agreed to take steps to see if recruits could not be more fully informed of the type of life they might expect during the earlier years of their service.

Kenya Veterinary Medical Association

The Kenya Veterinary Medical Association held its annual meeting on February 22nd. Mr. R. A. Hammond was elected President and the outgoing President, Dr. H. S. Purchase, retained office as Vice-President. Three short papers were read by Mr. J. R. Hudson, Dr. H. S. Purchase and myself. Reports of them, together with ensuing discussions, are being sent you.*

Standing Veterinary Research Committee

On February 18th and 19th there was a meeting of the Standing Veterinary Research Committee. To this annual meeting there were delegates from widely separated territories and it was very pleasant to welcome the visitors and to meet again many old friends. I attach a list of the delegates, since this may be of interest to some of your readers.

List of Delegates to the Standing Veterinary Research Committee's Meeting on February 18th, 1947

Mr. E. Beaumont, M.R.C.V.S., D.V.S.M., D.V.S. Kenya,
Mr. J. R. Hudson, M.R.C.V.S., B.Sc., D.D.V.S. Kenya.
Mr. H. J. Lowe, M.R.C.V.S., D.V.S. Tanganyika.
Mr. J. K. Wilde, M.R.C.V.S., B.Sc., A.R.C.S., Ag.C.V.R.O. Tanganyika.
Mr. H. Cronly, M.R.C.V.S., D.V.S.M., D.T.V.M., Ag.D.V.S. Uganda.
Mr. S. G. Wilson, M.R.C.V.S., B.Sc., S.V.R.O. Uganda.
Mr. J. Hobday, M.R.C.V.S., D.V.S. Northern Rhodesia.
Mr. G. Q. Fowler, M.R.C.V.S., Nyasaland.
Mr. J. T. Evans, M.R.C.V.S., C.V.R.O. Sudan.
Major Leach, M.R.C.V.S., R.A.V.C. Eritrea.
Major Pearson, M.R.C.V.S., R.A.V.C. Somalia.
Major Temple, M.R.C.V.S., R.A.V.C. Br. Somaliland.

Kabete Staff Conference

On February 20th and 21st, the annual staff conference of the Kenya Veterinary Department was held. The Member for Agriculture, Major Cavendish-Bentinck, attended on the afternoon of the second day. As a comparative newcomer to Kenya, I am very impressed by the value of these annual conferences. They are a most useful ground for the exchange of views on matters of professional and departmental interest and lead to a number of important decisions being taken. They must be of especial value to the Director in framing certain items of policy. As a stock-taking, they certainly reveal the great progress made by the profession in this young colony.

Social Activities

I now come to the lighter side and must tell you of our social activities. Our new Director and Mrs. Beaumont entertained us and our visitors to a most enjoyable sundowner on the 19th. There must have been about 70 people present in all and it provided a most pleasant opening of our festivities.

On the 20th we celebrated the inauguration of the Branch to be known as the Veterinary Association of Eastern Africa by a dinner and dance held at Torr's Hotel, under the auspices of the K.V.M.A. This was a great success and is for the future to be an annual event. Official guests were the Member for Agriculture, Major Cavendish-Bentinck, and Captain the Hon. E. H. Wright, Member of Legislative Council and Chairman of the Stock Owners' Association. The speeches are sent you as reported in the local press. (See our Notes and News columns.—*Editor.*)

On the 21st members were entertained to dinner at the New Stanley Hotel, by the local representative of Messrs. May and Baker Ltd., on behalf of the company. We were grateful to Messrs. May and Baker for a most enjoyable evening.

We have, therefore, had a busy time and we are now settling back to normal. The news I send you is, on the whole, good news—that is to say, the outlook is bright and we look forward to better things ahead. For the present we are still struggling forward with inadequate staff and tremendously high living costs; retirements and resignations exceed recruitment and unless steps are taken to reverse this trend, we are likely to find ourselves in a really serious position. However, as I say, we are hopeful that relief may soon be afforded.

Your readers may be interested to know that one of the two Rhodes scholars selected from Kenya, Mr. Sands, the son of a well-known Kenya farmer, intends after taking a scientific degree at Oxford, to become a veterinary surgeon. He spent some time as a student at the laboratory here.

Now I must report two weddings—that of Miss M. D. Ritchie, M.R.C.V.S., to Mr. I. Dundas of the Kenya Police, and of Mr. A. Dorman, M.R.C.V.S., to Mrs. Drummond Hay of Nanyuki, Kenya. We wish them the best of luck and all happiness.

We send our best wishes to members at home and especial good wishes to the parent association in its stand over service terms with the Ministry of Agriculture.

With kind regards,

Yours sincerely,

Central Veterinary Research Institute, R. N. Fiennes.
P.O. Kabete,
Kenya Colony.
March 3rd, 1947.

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The Iraq Veterinary Medical Association

We have pleasure, also, in reproducing the following extract from a letter recently received from Dr. H. A. Awkati, M.R.C.V.S., Hon. Secretary of the Iraq V.M.A. (affiliated to the N.V.M.A.) dated April 30th:—

The Iraq V.M.A. is comprised of 26 qualified civil veterinary surgeons whose duty it is to supervise the animal population, estimated to be twelve millions.

The last meeting was held in December, 1946, and coincided with the Middle East Veterinary Convention held in Baghdad. Turkey, Iran, Syria, Lebanon, Transjordan, Egypt, Saudi-Arabia and Iraq participated.

The convention was opened under the patronage of H.R.H. the Prince Regent on November 29th, 1946. Its purpose was:—

(*a*) To revise and amend the veterinary protocol of 1938 to meet present-day conditions.

(*b*) To enable the delegates to become acquainted with the Administration and the Regulations adopted for the control of specific contagious diseases within the territories of their neighbouring countries.

(*c*) To consider the biological products, vaccine and sera, etc., produced in the Middle East countries.

The convention was very successful and the delegates appreciated the benefit of such meetings.

Nigeria University College

It was announced on Thursday of last week that the Secretary of State for the Colonies, after consultation with the Inter-University Council on Higher Education in the Colonies, has selected Dr. Kenneth Mellanby, Reader in Medical Entomology in the University of London, to be Principal-designate of the University College which it is proposed to establish in Nigeria.

Dr. Mellanby, who was born in 1908 and educated at Barnard Castle School and King's College, Cambridge, has carried out extensive research work at the London School of Tropical Medicine and Hygiene and in East Africa (on tsetse fly). In 1945 he was awarded the O.B.E. "for distinguished services in connection with the preservation of the health of our troops in South-East Asia."

* These reports will be published in the next Supplement to *The Veterinary Record*, shortly to be issued, and the papers in the *Record* itself.—*Editor.*

F.A.O. Group Reports on Animal Health

The Food and Agriculture Organization of the League of Nations has now made public the main points of a series of recommendations submitted to Sir John Orr, Director-General, by a sub-committee on animal health. The group, comprising experts from eight countries, considered world problems of animal health and means by which F.A.O. could encourage greater international co-operation. The sub-committee, a part of F.A.O.'s Standing Advisory Committee on Agriculture, emphasized its view that F.A.O. should promote and co-ordinate national and international action rather than undertake responsibility for a whole programme of animal health.

It was recommended that F.A.O. assist in the distribution, testing and possible establishment of avianized rinderpest virus (produced by growing in chick embryos) for production of vaccine for countries such as Egypt, Kenya, and Siam where this disease is a serious problem. The possible establishment of an international research laboratory to study this disease was discussed, and will be examined carefully at the next meeting of the Office International des Epizooties.

The group recommended that F.A.O. assemble information on vaccines and other remedies, and co-operate with the Office International des Epizooties in arranging for field tests of vaccines under a variety of conditions. At present, there is no international arrangement for co-ordinating effort for testing vaccines and drugs. The group recommended that F.A.O. assist in making the combined results of these trials available to the veterinary profession as quickly as possible. It was also advised that F.A.O. disseminate information on the broad aspects of the nutritional needs of animals, and collect information on their genetic resistance to disease.

An international meeting of experts to be sponsored by F.A.O. was recommended for 1948 to discuss the whole problem of breeding livestock for adaptability in unfavourable environments, such as exist in tropical and sub-tropical regions.

The group emphasized that F.A.O. should obtain close co-operation among all national and international agencies in attacking animal diseases and related problems such as animal nutrition, animal genetics and the physiology of reproduction, and urged in particular that F.A.O. work closely with the Office International des Epizooties, which has headquarters in Paris.

A most important problem, the group said, was the shortage of trained veterinarians in most countries, particularly serious in view of the overcrowded conditions in veterinary schools in the United States of America, Great Britain, Australia, South Africa and other countries having well-equipped veterinary schools. These would be unable to accept many students from outside the respective countries for several years. A comprehensive study of this problem was recommended with a view to encouraging the setting up of training facilities in the countries that need more veterinary services.

It is well known that disease causes large economic losses in the livestock industry. For example, the Loveday Committee in England found during the war that animal losses due to mastitis, contagious abortion and sterility alone amounted to at least $68,000,000 per annum. A further example quoted is the loss which Germany suffered in 1938 from an outbreak of foot-and-mouth disease alone, amounting to $332,000,000. The sub-committee pointed out that one of the important difficulties confronting the group was the lack of fundamental statistics on large losses due to diseases of animals, especially in countries that do not have the great number of veterinarians and institutions dealing with animal health problems that are found in countries having reasonably adequate veterinary services.

F.A.O. was asked to circulate information about the survey of veterinary services now under way in the United States of America under the auspices of the National Research Council. The group considered that information on this comprehensive study of all existing services and potential needs for veterinarians would be useful as indicating the type of approach made to veterinary problems in the United States, and as a possible working basis for similar surveys by other member governments. Also, it was recommended that information should be collected on the production and distribution of veterinary supplies and equipment.

A study was recommended of the steps and regulations taken to control international movement of animals and livestock products, with a view to providing member governments with this information and to encouraging the establishment of international quarantine stations to facilitate the movement of valuable breeding stock.

The group laid great emphasis on the need for a re-orientation of veterinary practice. While the treatment of sick animals would always be important, it was stressed that disease prevention closely associated with improved feeding and management practices was the most important approach to the solution of animal health problems.

The group was convened for the Director-General of F.A.O. by Dr. Ralph W. Phillips, head of the Animal Industry Branch, and acting head of the Agriculture Division of F.A.O. Dr. P. J. du Toit, Director of the Veterinary Services for the Union of South Africa and Dean of the Faculty of Veterinary Science University of Pretoria, acted as chairman. Other members and observers at the meeting were:—

Sir Daniel Cabot, Chief Veterinary Officer, Ministry of Agriculture and Fisheries, London, England; Professor G. Flueckiger, Directeur de l'Office Vétérinaire Federal, Berne, Switzerland; Dr. Tom S. Hamilton, Professor and Chief in Animal Nutrition, University of Illinois, Urbana, Illinois; Dr. Charles A. Mitchell, Associate Director, Science Service and Chief of Division of Animal Pathology, Dominion Department of Agriculture, Hull, Quebec, Canada; Dr. Roy C. Newton, Vice-President, Swift and Company, Chicago, Illinois; Dr. H. W. Schoening, Chief, Pathological Division, Bureau of Animal Industry, Agricultural Research Administration, Washington, D.C.; Mr. Gonzeio Blanco, Technical Adviser on Agriculture, Division of Agricultural Co-operation, Pan-American Union, Washington, D.C. (Observer); Dr. James H. Steele, Chief, Veterinary Public Health Section, U.S. Public Health Service, Washington, D.C. (Observer), Dr. Charles Suebsaeng, Chief, Veterinary Division, Department of Animal Development, Ministry of Agriculture, Bankok, Siam (Observer); Dr. Sylvio Torres, D.V.M., Director, Instituto Pesquizas Veterinarias, Porto Alegro, Rio Grande do Sul, Brazil (Observer), and Dr. Aurelio Malaga-Alba, Mivaflores, Lima, Peru, Professor and Former Dean of Veterinary Faculty, University Mayor de San Marcos, Lima, Peru (Observer).

NOTES AND NEWS

Diary of Events

May 20th.—R.C.V.S. Council Election. Voting papers to be issued.
May 21st.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Bury St. Edmunds (Angel Hotel), 2.30 p.m.
May 23rd.—R.V.C. Students' Union Society Annual Ball, Grosvenor House, Park Lane, W., 8 p.m. to 1 a.m.
May 27th.—R.C.V.S. Council Election. Voting papers to be returned.
May 28th.—Annual Meeting of the West of Scotland Division, N.V.M.A., in the Glasgow Veterinary College, 2.15 p.m.
May 30th.—Meeting of the Royal Counties Division, N.V.M.A., at Oxford (Forum Restaurant), 2.30 p.m.
May 30th.—Meeting of the Sussex Division, N.V.M.A., at Brighton (Old Ship Hotel), 2.30 p.m.
May 31st.—Meeting of the Nutrition Society in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole Street, W.1: Scientific Meeting 10.30 a.m.; Annual Meeting 2 p.m.
June 3rd.—R.C.V.S. Annual General Meeting.
June 3rd and 4th.—R.C.V.S. Committee Meetings.
June 3rd.—V.V.B.F. Annual General Meeting.
June 5th.—R.C.V.S. Committee and Council Meetings.
June 5th.—Central Veterinary Society Visits Lady Wentworth's Arab Stud at Crawley and Mr. E. G. Langford's farm at Lingfield. (See Notice.)
June 11th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m. (Abstracts Sub-committee, 1.45 p.m.)
June 11th.—Summer Meeting of the Lancashire Division, N.V.M.A., at Chester. (See Notice.)
June 12th.—Meeting of the Central Veterinary Society at the Royal Veterinary College, N.W.1, 2 p.m.
June 13th.—R.A.V.C. Annual Dinner, Grosvenor House, London.
June 18th and 19th.—N.V.M.A. Committee Meetings, 36, Gordon Square, W.C.1.
June 20th.—N.V.M.A. **Council Meeting,** at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2.
June 26th and 27th.—R.C.V.S. Written Examinations.
July 28th—Aug. 1st.—N.V.M.A. Annual Congress in Edinburgh.

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New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

Questionnaire to Divisions, N.V.M.A.

Will members of the Association, who have not already done so, kindly complete the questionnaires sent to them by their Divisional Secretaries, and return them without delay either to those deputed to collect these replies in their Divisions, or, if no special arrangements have been made, to the General Secretary, N.V.M.A., direct.

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Children's Visit to Denmark

Through its President, Dr. N. Plum, the Danish Veterinary Association has once again extended an invitation, *via* this Association, to the children of British veterinary surgeons to visit Denmark during the summer holidays and has, in fact, already sent a list of Danish veterinary surgeons who would like to be their hosts. In view of the success of last year's visit, the N.V.M.A. has accepted this kind offer and the General Secretary would be pleased to hear from any members who would like their children to go. Arrangements can again be made through Cook's, but there is some urgency in the matter of fixing travelling facilities and those interested are asked to write in to the Association without delay.

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PERSONAL

Chair of Veterinary Physiology in the Royal Veterinary College

We learn that E. C. Amoroso, Esq., B.Sc., M.B., B.Ch., B.A.O., D.Phil., Ph.D., has been appointed to the Chair of Veterinary Physiology in the Royal Veterinary College, London. Professor Amoroso has hitherto occupied the post of Reader in Histology and Embryology in the College.

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Birth.—Good.—On May 9th, 1947, to Mary, wife of F. D. T. Good, M.R.C.V.S., of Highlands, Dibden Purlieu, Southampton, twin brothers for Louise and Rosemary. (Four children under three years of age.)

. . . . .

Marriage.—Broad—Terrett.—On Thursday, April 17th, 1947, at the Church of St. Martin's-in-the-Sands, Geneifa, Egypt, Captain Richard Cottle Broad, R.A.V.C., son of Mr. and Mrs. G. H. Broad of 39B, Goldhawk Road, London, W.12, and Noreen, elder daughter of Mr. and Mrs. T. Terrett, of Bayswater, London, W.2.

. . . . .

Mr. Samuel Laxton Hames, M.R.C.V.S.

Our readers will join with us in extending heartiest congratulations to Mr. Sam Hames, formerly of Somerby, Oakham, Rutland, who, heading the honoured list of *Chirurgorum Veterinariorum Collegii Regii Seniores*, celebrated his 92nd birthday on May 2nd.

As is pointed out by the *Leicester Mercury* in a biographical tribute, he is, in fact, nowadays, Mr. Samuel Laxton Hames, of Burrough Hall, Burrough-on-the-Hill, "but fox-hunting men all over the world when they meet to talk over days in Leicestershire will invariably mention 'Sam Hames of Somerby'."

The *Mercury* continues: "Mr. Hames can take his still alert memory back to the time when Mr. Coupland hunted the Quorn, and those were the days of Tom Firr the huntsman without peer.

"Mr. Hames is a son of Francis Hames, a saddler in Leicester Haymarket—which he can remember before the Clock Tower was built. He can recall Lord Stamford (of Groby) riding behind four horses and with postillions, arriving at the Bell Hotel. There a Mr. Boyer, who ran the 'Bell,' supplied the change of horses which took the Earl to the day's meet.

"Mr. Hames became a member of the Royal College of Veterinary Surgeons in 1873, and must have been the youngest 'vet.' in England. When he had been at the College for a little while, he found out that he could not take his diploma until he was 21. He thereupon convinced the registrar that he was two years older than the entry book stated. . . . Having qualified, Sam Hames went to help with the practice of a veterinary surgeon at Arundel—'a very nice man who ought to have been a professor.' From there to Chelmsford and the full responsibility of a practice. But then the business of juggling with his age troubled him in that he looked so young. It was to disturb him many years later when the Royal College marked him out as the oldest registered V.S. in England, while he himself wasn't so sure. . . .

"Mr. Hames remembers what is now the Fernie Hunt when Sir Bache Cunard hunted the country; also Tom Firr when he was second whip to the Quorn and raised to be huntsman without ever being first whip—an unheard of thing. 'The greatest huntsman of all Leicestershire history,' says Mr. Hames.

"In the town then, many people kept a horse and found an occasional day for hunting. But the streets were already becoming difficult for the rider, and Mr. Hames bought The Grange, Somerby, which belonged to the famous Major Candy. It was then that a great career in hunting really began. He piloted Miss Margot Tennant (Lady Oxford and Asquith), and in her memoirs she wrote of those days in Leicestershire with Sam Hames. But he says: 'The only time Lord Lonsdale ever called me to order was when she was following me. Hounds had feathered out to the right as we jumped and we were right upon them. He *did* talk to me.' At a later time he remembers the 'desperate' bravery of the Duke of Windsor. Mr. Hames sold him the first mare he hunted on. Of the Duke's keenness to jump anything that came along Mr. Hames reflects, 'It was wonderful how he always escaped.'

"Mr. Hames bought the hunters for the Duke of Gloucester when he came to Leicestershire, and he was the hunting pilot for all visiting members of the Royal Family. Coaching was a hobby of his. A born whip, he drove on many a famous four-in-hand in the days of the London-Brighton runs."

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Eradicating Rinderpest from East Africa

Veterinary Conference Plans

The *East African News Review* reports that the eradication of rinderpest from Kenya, Uganda, Tanganyika, Northern Rhodesia and Nyasaland was accepted as a policy by a two-day conference of veterinary experts held in Nairobi in February.

"Three times during the last half century, rinderpest has swept southwards through East Africa, passing from game to cattle and from cattle to game, with disastrous effects on both. The last large-scale outbreak occurred during the war, and this was stopped at the southern border of Tanganyika by prompt and vigorous action in immunizing very large numbers of cattle, with the assistance of officers sent from South Africa and other territories lying to the south of the critical area. The success of this campaign has suggested the possibility of the complete eradication of rinderpest from Eastern Africa, and its ultimate eradication from Africa as a whole.

"It is not yet known whether the immunization of all stock in those areas will cause the disease to die out completely, but it is thought that the virulence of the disease may only be maintained by constantly passing from cattle to game and back to cattle. It is possible that a continued policy of immunization may be necessary for permanent control.

Lack of Field Staff

"Since all large outbreaks of rinderpest appear to begin to the north of Kenya and Uganda, great importance is attached to the presence of representatives from the Sudan, British Somaliland and the military administrations of Somaliland and Eritrea at the Nairobi Conference.

"These representatives, however, expressed doubts as to whether, with their present lack of field staff, they would be able to carry out a policy of complete eradication along the lines planned by their southern neighbours. One of these territories has only a single Veterinary Officer for the whole territory.

"The Conference also discussed foot-and-mouth disease and East Coast fever, and considered at some length the effect of the new insecticides, both on the destruction of ticks which carry East Coast fever and on work in connection with the tsetse fly.

"Detailed proposals were also endorsed for establishing an East African Veterinary Research organization which would include the Central Veterinary Research Institute at Kabete as its principal unit, and involve research undertaken at suitable places in Kenya, Uganda and Tanganyika. (See elsewhere in this issue.—*Editor, Vet. Rec.*) An official statement announcing this states that it has been estimated that the capital represented by cattle, sheep and goats in East Africa is certainly not less than £30,000,000, and that the turnover represents an annual value to the territories of at least £6,000,000."

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Tribute to the Work of the Kenya Veterinary Department

That the Veterinary Department of Kenya had supplied the "astronomical" figure of 8,000,000 doses a year of biological products, some of them as far afield as Egypt, Palestine, Greece and Yugoslavia, was stated by the Member for Agriculture, Animal Husbandry and Natural Resources, Mr. F. W. Cavendish-Bentinck, at a dinner given by the Kenya Veterinary Medical Association in February.

Mr. Cavendish-Bentinck took the opportunity of thanking the Veterinary Department for the work they had done in spite of

shortage of staff during the war years. Throughout the war, the rinderpest campaign was waged without ceasing, and rinderpest was getting rarer every day, certainly in Kenya, Uganda and Tanganyika Territory. They had largely eradicated contagious bovine pleuro-pneumonia from large areas in Kenya and practically reduced the disease to a minor nuisance. He mentioned that veterinarians had come to the Research Laboratories at Kabete from all over the world for experience and instruction or to try out some of their work.

He spoke of the unimportance of political boundaries in the field of veterinary work, and announced the formation of an East African branch of the National Veterinary Medical Association, to co-ordinate the profession throughout East Africa.

Mr. R. H. Hammond, proposing the toast of the Guests of Honour, recalled that at a corresponding dinner given by the parent Association in London, the Minister of Agriculture, who was to have been guest of honour (and with whom negotiations were proceeding at the time of the dinner), had cancelled his acceptance of the invitation less than 36 hours before the dinner. Sir John Boyd Orr had been asked to fill the breach, and had just managed to arrive in time.

Dr. Purchase (President of the Kenya V.M.A.), thanking all those who had made the dinner possible, spoke of the cordial relations existing between the Association and the Stockowners' Association, whose President, Capt. E. H. Wright, was present at the dinner.

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"MAINTAIN CATTLE POPULATION"

At the annual meeting of the Seed, Oil Cake and General Produce Association at Liverpool, Mr. T. O. Skinner, who presided, said (reports the *Meat Trades Journal*): "Bearing in mind our splendid pasture lands, one wonders if it would not be better policy to import materials for feeding-stuffs in quantities sufficient to replenish and maintain permanently our cattle, pig and poultry population, rather than to follow the present policy of reducing our livestock and importing livestock products of other countries.

"It was said by some during the war that to import the products occupied less shipping space than would have been required by feeding-stuffs materials, but if this were the case then, it should not apply now, when so much shipping is released from war transport needs.

"Certainly, after the experience of two world wars, future Governments should adopt a policy for food supplies which will ensure that never again will this country be reduced to such a dangerous situation, and the rations to such meagre proportions."

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Adrenalin in oil, 1 to 500, is said to prolong the effect of the drug in urticaria, asthma and serum stocks, from nine to twelve hours beyond the time the effects would pass off when it is given in aqueous solution. The solution of adrenalin in oil is given intramuscularly and the dose is the same as for the 1 to 1,000 aqueous solution.—*Vet. Med.*

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UNITED STATES AND MEXICO CO-OPERATE IN FOOT-AND-MOUTH DISEASE CONTROL

United States veterinary journals report that by the action of the Congress and approval of the President, the United States Department of Agriculture and the Department of State are authorized to co-operate with any other Government in the control and eradication of foot-and-mouth disease and rinderpest when either of these diseases endangers the livestock industry of the United States.

Co-operation with Mexico in combating the present outbreak of foot-and-mouth disease in that country will begin at once. Personnel, equipment and materials, for operation in the field, and a laboratory will be furnished by the United States.

The Mexican-United States Agricultural Commission met on March 6th to consider the question of co-operation between the Governments of Mexico and the United States in a programme for eradication of foot-and-mouth disease in Mexico.

The Commission passed the following formal resolution: "That the eradication of foot-and-mouth disease in Mexico and the prevention of its spread into the United States will require vigorous action lasting over a considerable period and involving intricate administrative and supervisory problems, and the handling of extensive funds, and will often require prompt decision and action under competent direction, the Mexico-United States Agricultural Commission."

The following recommendations were made:—

1. That there be established in Mexico City at the earliest possible date a joint office for the eradication of foot-and-mouth disease.

2. That this office be administered by a director and a co-director who shall be jointly responsible for the active direction of the campaign against foot-and-mouth disease, and for the expenditures of funds supplied by the two Governments for that purpose. The director should be a Mexican citizen appointed by the Mexican Secretary of Agriculture and livestock industry. The co-director should be a United States citizen appointed by the United States Secretary of Agriculture.

3. That there be established a joint administrative board for the eradication of foot-and-mouth disease to which the director and co-director shall be responsible. This board shall be responsible for the policies and procedures to be followed by the office. The board shall consist of three members appointed by the Mexican and three by the U.S. Secretary of Agriculture and the director and co-director of the office.

4. That the Mexican and United States Sections of the administrative board should each arrange for the appointment of an advisory committee consisting of such persons as may be desired.

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FOOD AND AGRICULTURE ORGANIZATION: PRODUCTION AND RESEARCH

Dr. G. Scott Robertson, Permanent Secretary of the Ministry of Agriculture for Northern Ireland, has been seconded for a period of six months to take up the post of director of agricultural production and research under the Food and Agriculture Organization of the United Nations. In its issue of May 10th *Nature* records that Dr. Scott Robertson went to Northern Ireland in 1922 and held the dual post of professor of agricultural chemistry in the Queen's University of Belfast and senior research officer of the Ministry of Agriculture. It was during this period that he continued the now classic work on phosphatic fertilizers which he had been conducting for several years in Essex while head of the Agricultural Chemistry Department of the East Anglian Institute of Agriculture. At the same time Dr. Scott Robertson started a series of investigations on the mineral requirements of farm livestock, paying particular attention to those of poultry. This work was carried out in close collaboration with Sir John Boyd Orr, who was then director of the Rowett Research Institute. In 1928, Dr. Scott Robertson became chief inspector of the Ministry of Agriculture for Northern Ireland, and later was appointed permanent Secretary when Dr. J. S. Gordon retired. For many years Dr. Robertson has acted as assessor on the Agricultural Research Council and United Kingdom delegate to the meetings of the Imperial Agricultural Bureaux. Thus he brings to his new work many years' experience in agricultural research, coupled with administrative knowledge gained as head of a department the energies of which have been devoted to the task of production at the highest possible level for more than seven years.

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ATTESTED HERDS IN CARMARTHEN

At a meeting of the Carmarthenshire Agricultural Committee, Mr. Thomas Thomas, Caeffaer, said that the number of attested herds in the county under the Tuberculosis (Attested Herds) Scheme was 3,699, which represented the highest number of herds attested in Great Britain. There was a real awakening in other counties to the advantages of attestation. He appealed to all farmers in Carmarthenshire to come into the scheme. It was very desirable from a national point of view that the county should become a "clean" area.

Ald. David Davies, Uwchgwili, said that the approximate percentage of attested herds in the country was 53. Although Carmarthenshire had the highest number of attested herds the highest percentage figure was held by Cardiganshire. "We should keep the percentage figure up as well as the numbers," he added.

Mr. S. O. Thomas, Trelech, said the Committee should press upon the Ministry to provide the county with sufficient veterinary surgeons to make Carmarthenshire a "clean" area in order that a reservoir of attested cattle could be formed to supply other counties in England and Wales.

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WORLD MEDICAL ASSOCIATION

The Organizing Committee of the World Medical Association has met at B.M.A. House, under the chairmanship of Dr. T. C. Routley, Secretary of the Canadian Medical Association and Chairman of the Executive of the World Health Organization, on which body he is the official representative of the Government of Canada. It will be remembered that the International Conference arranged by the British Medical Association last September for representatives

of national medical associations resulted in the inauguration of the World Medical Association. At that conference the aims of the World Medical Association were formulated and an Organizing Committee appointed to draft articles and by-laws and to undertake the preliminary work of organization. This committee met in Paris in November, 1946, and recently in London.

The aims of the World Medical Association, as formulated at its inauguration, are as follows: "To promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available in order to assist all peoples of the world to attain the highest possible level of health; to study the professional problems which confront the profession; to organize an exchange of information on matters of interest to the profession; and to establish relations with, and to present the views of the medical profession to, the World Health Organization and the United Nations Educational, Scientific and Cultural Organization."

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED APRIL 30TH, 1947

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	10	10	218	129
Berks	1	47	48	1,546	1,097
Bucks	—	36	36	938	965
Cambridge	—	1	1	57	21
Cheshire	3	140	143	4,843	1,948
Cornwall	—	—	—	—	—
Cumberland	—	7	7	260	200
Derby	7	220	227	6,357	3,734
Devon	—	144	144	1,998	1,465
Dorset	—	12	12	378	149
Durham	1	165	166	3,522	1,445
Essex	1	106	107	3,797	2,775
Gloucester	—	32	32	1,074	901
Hampshire	11	177	188	6,022	3,980
Hereford	—	5	5	163	137
Hertford	—	28	28	859	556
Hunts	—	—	—	—	—
Isle of Ely	—	—	—	—	—
Isle of Wight	—	—	—	—	—
Kent	—	72	72	1,623	1,127
Lancs	1	87	88	2,687	1,884
Leics	—	63	63	1,616	1,314
Lincs (Holland)	—	—	—	—	—
Lincs (Kesteven)	1	12	13	166	141
Lincs (Lindsey)	1	17	18	513	499
Middlesex	—	2	2	34	25
Norfolk	—	57	57	1,808	1,320
Northants	1	24	25	597	664
Northumberland	2	34	36	1,187	784
Notts	4	110	114	2,607	1,497
Oxford	—	11	11	265	236
Rutland	—	1	1	24	12
Salop	—	69	69	2,045	1,244
Soke of Peterborough	—	—	—	—	—
Somerset	1	107	108	2,757	1,716
Staffs	1	104	105	3,176	2,067
Suffolk (East)	—	27	27	544	392
Suffolk (West)	—	28	28	542	467
Surrey	1	47	48	1,254	799
Sussex (East)	—	53	53	1,653	1,189
Sussex (West)	15	23	38	1,185	699
Warwick	1	63	64	1,709	1,309
Westmorland	—	1	1	11	10
Wilts	—	45	45	1,919	1,100
Worcester	—	81	81	1,593	892
Yorks (E.R.)	2	47	49	828	605
Yorks (N.R.)	1	59	60	1,404	1,006
Yorks (W.R.)	1	110	111	2,676	1,309
WALES					
Anglesey	2	7	9	154	115
Brecon	—	5	5	99	68
Caernarvon	—	25	25	482	219
Cardigan	—	28	28	574	390
Carmarthen	7	143	150	2,927	1,569
Denbigh	—	11	11	213	108
Flint	1	25	26	588	308
Glamorgan	1	35	36	579	287
Merioneth	—	6	6	93	31
Monmouth	1	6	7	139	93
Montgomery	—	1	1	6	—
Pembroke	—	9	9	243	256
Radnor	—	1	1	4	—
TOTALS	69	2,786	2,855	74,656	46,353

Notes.—(1) Operative periods of undertakings: 1 year, 803; 2 years, 177; 3 years, 1,875. (2) Undertakings renewed for further periods: 1 year, 34; 2 years, 2 3 years, 11. (3) Undertakings not renewed at end of operative periods, 87. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings and do not include undertakings renewed for further periods. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	—	17	17	891	381
Angus	—	14	14	581	425
Argyll	—	—	—	—	—
Ayr	—	9	9	316	177
Banff	—	1	1	120	20
Berwick	—	1	1	22	7
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	2	2	42	22
Dumfries	—	11	11	572	519
Dunbarton	—	1	1	60	40
East Lothian	—	1	1	20	8
Fife	—	19	19	656	440
Inverness	—	1	1	47	20
Kincardine	—	2	2	60	68
Kinross	—	3	3	60	43
Kirkcudbright	—	5	5	733	601
Lanark	—	6	6	274	185
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	—	—	—	—
Perth	—	9	9	274	214
Renfrew	—	4	4	151	101
Ross-shire	—	3	3	130	62
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	7	7	291	243
Sutherland	—	4	4	85	39
West Lothian	—	2	2	75	22
Wigtown	—	13	13	1,063	621
Zetland	—	—	—	—	—
TOTALS	—	135	135	6,523	4,258

Notes.—(1) Duration of undertakings: 1 year, 34; 2 years, 7; 3 years, 94. (2) Undertakings renewed for a further period (included in column 2 of statement): 1 year, 110; 2 years, 9; 3 years, 70. (3) Undertakings expired and not renewed (not included in column 2 of statement): 263. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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THE MILKING TRIAL AT THE "ROYAL"

In a recent issue of its *News Service* the Ministry of Agriculture features the coming show season and points out that livestock appearance must necessarily be linked with production, especially in the dairy section: thus it is necessary to study not only the animal, but also its performance. In some of the cattle classes, certain standards of milk production are laid down. In one notable case there is a class for British Friesian 2,000-gallon cows. Shorthorn females that are four years old and upwards on the day of the show must qualify according to the breed standards, and for most other breeds there is some form of qualification. The note proceeds:—

"In these days, when every gallon of milk is needed, much interest will be taken in the Milk Yield class. At the Royal Show to be held at Lincoln from July 1st to 4th, one of the main features will be the Milking Trial, in which the various breeds compete against each other for what might be called the 'Blue ribbon' of the Show. For this Trial the main conditions are fully set out in the Prize List and catalogue; but here are some of the most important from the spectator's point of view. A calf must have been produced not later than June 17th, 1947. Animals must be delivered to the Showyard by 6 p.m. Saturday, June 28th. Cows shall be milked by hand by one person, no more than 25 minutes being allowed for milking. All animals are milked thrice daily by the same person.

"Points will be awarded as follows. One point for every 1 lb. of milk given at the 6 a.m., 1 p.m. and 8 p.m. milkings on Monday, June 30th. One point for every ten days since calving, calculated to the first day of the Trial, deducting the first 40 days; the maximum lactation points being twelve. One point will be added for every ten days that shall have elapsed since the date of service of the cow, deducting the first 40 days of this period. No service is to date from less than 40 days after the calving of the cow. Maximum service points obtainable are twelve. Ten points will be awarded for every 1 per cent. of butter-fat over 3 per cent., calculated from the average percentage of butter-fat found in the milk for the period. Cows whose milk shows less than 3 per cent. of butter-fat, reckoned on an average of the fat percentage found in the three milkings, will be disqualified.

"Prizes and Commendations will be awarded only to cattle having obtained at least the following points:—

	Cows 5 years old and over on the first day of the Show. Points.	Cows and Heifers under 5 years on the first day of the Show. Points.
Dairy, Shorthorn, South Devon, Red Poll, Lincoln Red Shorthorn or British Friesian ...	56	50
Ayrshire, Guernsey or Jersey	51	45
Kerry or Dexter	41	35

"It will be interesting to see what improvement, if any, has been made in butter-fat production since the last pre-war Show held at Windsor in 1939. It is surprising how many animals and different breeds at Windsor failed to come up to the legal standard of 3 per cent., particularly at the 6 a.m. milking. Samples were tested from 96 animals on three occasions, and 61 samples contained less than 3 per cent. fat, including 42 at 6 a.m., 6 at 1 p.m. and 13 at 8 p.m."

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BRECON CALF SALVAGING SCHEME

In the spring of last year the Livestock Improvement Subcommittee of the Breconshire Agricultural Executive Committee realized that many hundreds of good Hereford and Hereford cross-bred calves were going for slaughter prematurely through the Ministry of Food's Collecting Centres. A scheme was put into operation, therefore, on April 1st whereby the Animal Husbandry Officers attend the principal markets in the county and salvage the best type of calf. The calves are taken to the Committee's Collecting Centre at Aberyscir Farm. They are immediately inoculated against white scour, and the loss is as low as 1 per cent. The calves remain at Aberyscir only for such time as a load of 20 to 30 can be collected for export to English counties. The method of rearing that has been successfully practised is quite simple but requires great skill on the part of the stockman, since the number of calves varies from week to week, depending on the demand from importing counties. The usual practice, however, is for the newly calved nurse cows to suckle for about eight weeks, after which they weaned; and a further three calves are suckled for a similar period, followed by two calves. The cows are usually able to suckle one more calf, depending, of course, on their milking capacity. The cows used for this are those unsuited for the dairy herd; they are kept for three or four seasons and are mated to a Hereford bull, usually producing a calf every 14 months or so. Young calves are encouraged to eat concentrates at a very early age and clean water is provided *ad lib.* Only the best quality hay is fed. To date about 700 calves have been salvaged. Taking the average live weight of a beast to be 10 cwt. at 2½ years old, it is seen that about 200 tons of beef will be made available for the nation. The demand for good quality beef calves far exceeds the supply, counties like Gloucester, Northampton and Norfolk taking most of the animals.—*Ministry of Agriculture.*

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THE INTERNATIONAL HORSE SHOW

The International Horse Show, for so long a conspicuous event in the London season, will be held this year at the White City Stadium, Shepherd's Bush, from July 7th to July 11th, inclusive, and France, Spain, Switzerland, Belgium and Eire are sending over representatives to compete in the team and individual contests.

Gala days, those former brilliant spectacles at Olympia, will also be revived at the White City, the first, on the afternoon of Wednesday, July 9th, when the final contest for the King George V gold cup, an individual jumping event for amateur and officer riders, will be decided, and the second, on the afternoon of Friday, July 11th, when the Edward Prince of Wales gold cup event for teams of three officers or civilians of the same nationality will come up for decision. As in past years, the *Daily Mail* championship jumping cup will be decided as the last event on the final evening, Friday, July 11th, and it is open to all first, second and third prize winners in the six other competitions spread over the week's jumping. There will be no high-jumping contest this year, but the jumping events include a touch and out competition for amateur and officer riders; an international pair contest in which two horses will jump abreast; an inter-county pair jumping event and some competitions for juvenile riders.

One competition which is sure to make strong appeal is the Dressage Test, to discover the best trained riding horse in the show, ridden by a British subject. In previous years it has been won by Captain J. E. Hance, Miss Joan Cull and the Weedon Equitation School.

The Coaching Marathon, for the Bertram Mills cup, will be started from the Marble Arch and judged in the ring at the White City.

Admirers of the Arabian horse will have the opportunity of seeing a class of stallions, mares or geldings ridden astride or side saddle. Weight-carrying cobs, hacks, hunters, hunt teams (belonging to recognized hunts in the United Kingdom), children's riding ponies and harness horses and ponies also figure in the programme.

A class for amateur-driven and amateur-owned Hackneys in harness must interest those owners who do not use the services of a professional in the preparation of their horses.

The inevitable Costers' pony turn-out class will attract competitors from every part of London, in view of the fact that there are twenty prizes to be won as well as "appearance money" for those who are passed into the ring but do not secure an award.

Many foreign visitors coming to England to see the breeding stock at the Royal Agricultural Show at Lincoln, during the week preceding the International Horse Show, are staying over to witness the judging of "the finished article" among Britain's riding horses and ponies and to share in the inevitable rivalry aroused by the Continental nations engaged in the jumping events at the White City.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents should write as briefly as possible and letters should not exceed 350 words.

CHEMICAL METHODS OF DIAGNOSIS AS APPLIED TO BOVINES

Sir,—I was very interested to read in your issue of February 8th, the paper entitled "The Diagnosis of Traumatic Reticulitis and Pericarditis of Bovines" presented by Mr. G. H. Arthur.

If I may be permitted, I would like to make a few criticisms of and add a few notes to the statements made by Mr. Arthur with regard to the value of chemical methods of diagnosis as applied to bovines.

1. Differentiation of Traumatic Reticulitis from Acetonaemia

The application of Rothera's test to the urine will in many cases give a positive result for acetone bodies since small amounts may occur normally in the urine of Herbivora. However, if Gerhardt's test is also applied, this will give a rough estimate of the degree of ketosis (if any) present since Rothera's test will detect one part of acetoacetic acid in 100,000 parts of urine, while Gerhardt's test detects one part in 7,000 parts of urine.

Rothera's test, as Mr. Arthur states, is of little or no value in the diagnosis of traumatic reticulitis.

2. Urine Analysis

Mr. Arthur states quite correctly that most of our tests for abnormal urinary constituents were adopted from human clinical pathology, but adds that "it did not necessarily follow that they were reliable when applied to cattle." Since the constituents responsible for giving these tests are chemically the same whether they arise from human or animal sources, there is no logical reason to suppose that such tests should not be reliable when applied to cattle. I would suggest that not sufficient care is taken when carrying out these tests—so many of our "non-laboratory-minded" practitioners think it will suffice to take any quantity of urine, whatever its condition, and treat it with any amount of reagent to get a reliable result.

Mr. Arthur criticizes specifically Heller's test for albumin, Gmelin's test for bile pigments and Hay's test for bile salts.

Heller's test.—It should be made quite clear at the outset that any urine to be tested for albumin should be rendered clear and free from mucin, which constitutes the most common source of error, by acidifying with a few drops of acetic acid, shaking with a little animal charcoal and filtering. If it is desired, from the point of view of saving time or through lack of equipment, to omit this procedure, a more reliable test than Heller's test is the so-called "Purdy's heat test" in which to approximately 10 c.c. urine, five to ten drops 50 per cent. acetic acid are added, the solutions mixed and the upper inch of the solution heated (by holding the tube at the bottom). A white cloud in the heated part indicates the presence of albumin. The addition of sodium chloride raises the specific gravity of the solution and prevents precipitation of mucin.

Gmelin's test.—This test is more reliable if carried out not directly on urine, but upon the precipitate obtained from urine after adding lime-water. Any bilirubin present is carried down as an insoluble calcium compound, thus concentrating the pigment and avoiding interfering substances.

Hay's test.—For this test to be carried out with any success *the urine must not be warm.* If this condition is fulfilled, the test is quite valuable as it is semi-quantitative. If the flowers of sulphur sink at once, bile salts are present to the extent of 0·01 per cent. or more, if they sink only after gentle shaking, the concentration is 0·0025 per cent. or more, while if they remain floating even after gentle shaking, bile salts are absent.

An alternative test to this is Oliver's test which consists of adding to urine acidified with acetic acid, after filtration, a little clear 1 per cent. solution of Witte's peptone. A white precipitate indicates the presence of bile salts.

3. Tests of Liver Function

I do not consider that Mr. Arthur answered Miss Uvarov's question as to the availability of tests for liver involvement. Mr. Arthur states that "where there is a great deal of tissue breakdown, as in necrosis of the liver, one might find that there was a very copious deposit of uric acid and urates which appeared when the urine cooled." While it is quite true to say that an increase in the urine uric acid does occur in cases of *active* destruction of the liver, may I point out that this is by no means the only condition under which such an increase can occur. Other conditions include active destruction of any organ rich in nuclei, during absorption of a pneumonic exudate, cases of leukaemia, nephritis, acute fever, eclampsia, etc.

There are several tests of liver function which have been used in Medical Biochemistry including the bromsulphalein test (Rosenthal & White. (1925.) *J. Amer. med. Ass.* **84.** 1,112), the rose bengal test (Delprat. (1923.) *Arch. Int. Med.* **32.** 401; Stowe, Delprat & Weeks. (1933.) *Amer. J. Clin. Path.* **3.** 55), the galactose tolerance test (King & Aitken. (1940.) *Lancet.* **ii.** 543), the hippuric acid test (Quick. (1936.) *Arch. Int. Med.* **57.** 544) and the estimation of l (–) tyrosine in the urine (Lichtmann. (1934.) *Arch. Int. Med.* **53.** 680; Lawrie. (1947.) *Biochem J.* **41.** 41).

Of these tests those most applicable to veterinary usage are the rose bengal test and the bromsulphalein test. The latter involves taking blood samples at half an hour and one hour after intravenous injection of 1 c.c. of a 1 per cent. solution of bromsulphalein per 10 kilos live weight and comparison of the colour of the serum after being made alkaline by addition of sodium hydroxide solution with that of standard solutions of bromsulphalein similarly treated.

The rose bengal test, on the other hand, is more rapid and therefore more suited to the needs of the veterinary diagnostician. It consists of the intravenous injection of 5 to 10 c.c. of a 1 to 2 per cent. solution of rose bengal (disodium tetraiodotetrachlorfluorescein) in physiological saline; 8 c.c. of blood are withdrawn into an oxalated tube after two minutes and then again after exactly a further six minutes. After centrifuging both samples, 3 c.c. plasma are pipetted off, 6 c.c. acetone added to precipitate the proteins and the samples spun again. If the plasma is yellow due to the presence of bile pigment, three drops of a saturated solution of sodium hydroxide are added, the mixture allowed to stand for 15 minutes in a subdued light and the solution then centrifuged once more. The colours of the two plasmas are then compared in a colorimeter.

If no colorimeter is available the following method may be used. Two small test-tubes of equal bore are selected and a known volume of the eight-minute sample is pipetted into one of them. The two-minute sample is run into the other a little at a time from a graduated pipette until the colours in the two tubes just match when viewed from above over a sheet of white paper placed so that it reflects light from a window. The volume of the two-minute sample needed for the colours to match is noted.

This test depends upon the fact that it has been found by experiment that in the normal human subject, the amount of colour in the plasma taken after eight minutes (total time) is only 50 per cent. of that in the plasma taken at two minutes.

The percentage of normal liver function is given by $200 - \frac{200\ S}{T}$

where S is the colorimeter reading of the two-minute sample and T that of the eight-minute sample, or if the solutions are compared in test-tubes.

$$200 - 200 \frac{\text{volume of 2-minute sample}}{\text{volume of 8-minute sample}}$$

Admittedly this test is based upon experimental work carried out on the human subject, but there is no reason why, if an average value for normal animals were obtained, it should not be applied to these various animals.

It is necessary to point out that rose bengal is photosensitizing and the subject should therefore be kept out of direct sunlight for a few hours, and that the faeces are red-stained.

In conclusion may I state that, in my opinion, sufficient use is not made by the general practitioner of chemical methods as applied to clinical medicine.

Yours faithfully,

R. J. Garner,
Veterinary Research Officer.

Veterinary Research Laboratory,
Vom, P.O. Bukuru,
N. Nigeria.
April 22nd, 1947.

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"INFECTIOUS CATARRHAL FEVER OF DOGS"

Sir,—The increasing interest being taken by members of the profession in the condition termed "Infectious Catarrhal Fever of Dogs," is very refreshing to the harassed practitioner.

Mr. Townson's clear précis of the condition covers the possibility of a neurotrophic virus as the pathogen by his rather wide mention of "an atypical form of distemper." Mr. von Lustig-Lendva's experience of trouble following distemper inoculation is amply borne out, but I have seen the same condition develop after inoculation of other vaccines and foreign proteins each of which, being responsible for some systemic reaction, results in lowered resistance. I have found that the incubation period varies from a few days to several weeks. I have seen it attack individual members of a group of dogs. This suggests to me an organism of comparatively low virulence and requiring some "trigger" to become pathogenic.

I was disappointed to note the omission of calcium borogluconate amongst the therapeutic agents mentioned in the treatment of the nervous sequelae. I have seen many dogs recover fully and immediately after the intravenous injection of a solution of calcium borogluconate (20 c.c. of a 20 per cent. solution). I was gratified to have Professor McCunn's confirmation of the value of this treatment.

We hear a lot these days of the troubles in store for us as a result of the bacteriostatic policy of modern research. I would point out, however, that it is by no means certain yet that the resistance organisms attain to penicillin and other therapeutic agents becomes a *permanent* characteristic of those organisms.

Yours faithfully

35, Church Street, E. F. Lewis.
Steyning, Sussex.
May 10th, 1947.

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SUPERFECUNDATION

Sir,—Your correspondent, Mr. R. W. Hartley, has not, I fear, made out a very convincing case for the existence of superfecundation, in the case which he describes in your issue of May 3rd. It is not unknown in the cow, and relatively common in the mare, for twin foetuses, although conceived where only one service has taken place, to die at different stages of intra-uterine development, and yet be born or aborted at the same time. The real point of interest behind this phenomenon, is, however, the *extreme* rarity of authenticated records of twin foals having survived—so rare as to open up a wide field of speculation as to whether there is some lethal factor at work.

Yours faithfully,

Chipping Norton, Paul Crosfield.
Oxon.
May 6th, 1947.

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SULPHANILAMIDE AS A TREATMENT FOR FOOT-ROT IN SHEEP

Sir,—In your current issue we have been interested in noting a reference on page 227 to the possible value of sulphanilamide as a treatment for foot-rot in sheep.

Your adviser has in this particular instance quite rightly focused attention on the treatment of foul-in-the-foot or foot-rot in cattle by sodium sulphapyridine administered by intravenous injection. The original work by Forman has now been confirmed on quite a large scale in this country.

In the printed reply now under review, however, reference is made to the intravenous injection of sodium sulphathalidine. Sulphathalidine is a Registered Trade Mark for phthalylsulphathiazole, a sulphonamide compound used extensively in the chemotherapy of

bacterial infections of the intestinal tract. It owes its high local activity to being poorly absorbed from the intestinal tract, and as such it will be appreciated that the sodium salt, being more soluble, would defeat the purpose for which the parent substance is employed.

Under these circumstances we are sure that reference to sodium sulphathalidine is due to a misprint or misunderstanding, and that sodium sulphapyridine is the compound intended.

As there has been considerable professional interest in the treatment of foot-rot in cattle by this particular sulphonamide compound, we shall be very pleased if you can arrange for a correction to appear in your next issue.

We are,
Yours faithfully,
Pharmaceutical Specialities (May & Baker) Limited,
R. Paisley,
Veterinary Department.

May 12th, 1947.

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VICTORIA VETERINARY BENEVOLENT FUND

Sir,—The amount of support accorded to the above fund by the profession in general shows so much apathy and lack of interest as to merit reproach. If members realized the amount of distress and privation that exists amongst many people left in necessitous circumstances through ill-fortune, I am sure the response to the appeals for support would be greater.

I would make a suggestion which if acted on by a number of my colleagues would bring in a substantial amount annually. At this time of the year veterinary surgeons are in much request to give their services in an honorary capacity at many functions such as Horse and Cattle Shows, Gymkhanas, Dog Shows, etc.

I would suggest that when agreeing to act members give a strong hint that a donation to our fund would be very acceptable.

I feel certain the average committee will view the request favourably and I trust many members will act on this suggestion, as I certainly will in future.

With thanks for the courtesy of your columns.

I am,
Yours faithfully,
Northampton. J. J. Dunlop.
May 10th, 1947.

R.C.V.S. COUNCIL ELECTION

ADDRESSES OF CANDIDATES

To the Members and Fellows of the Royal College of Veterinary Surgeons:

Ladies and Gentlemen,—As at the forthcoming elections to the Council of the Royal College of Veterinary Surgeons it is the third occasion on which I have been privileged to offer myself as a candidate, my views on matters with which that Council is concerned are already well known to my colleagues. On this occasion, therefore, in asking for the support of my many friends and colleagues in the profession, I would like to assure them that if elected to the Council I shall do my utmost to ensure that the veterinary profession remains master of its own future and that if, as now appears inevitable, the profession must share both the advantages and disadvantages of University education, it must do so on nothing less than full and independent Faculty status. I shall endeavour to ensure that the Council of the Royal College of Veterinary Surgeons retains to the full its control over entry into the profession and that it shall resist to the utmost any dilution of its composition by non-veterinary personnel. The Council is not only concerned with the entry of members into the profession, but with their conduct once their names have been entered on the Register. The full Council has, from time to time, to investigate complaints against members. Some of these complaints may be trivial; their origin may arise from biased sources, and it seems advisable that on the Council there should be sufficient members who have themselves had a *varied* experience of professional activity and have known the difficulties which may confront *any* member of the profession, so that a fair and balanced judgment may be brought to bear on complaints which may be investigated.

It is not as one seeking election for the purpose of providing one's self with an amusing hobby to occupy one's time during retirement or in the declining years of life, but as a comparatively young member of the profession who has had experience in many branches and who has the expectation before him of many years of service to give to the profession that I seek election, knowing full well that the duties of members of Council, if carried out conscientiously, involve heavy responsibilities; especially at the present time.

If elected by your votes to the Council I hope to show the same perseverance in furthering the aims of the profession as I have done in my efforts to secure election by offering myself as a candidate on this the third successive occasion.

I am, Ladies and Gentlemen,
Yours very truly,
Royal Veterinary College, Harold Burrow.
Field Station,
Streatley, Berks.
May 10th, 1947.

. . . . .

To the Members and Fellows of the Royal College of Veterinary Surgeons:

Ladies and Gentlemen,—I have the honour of seeking re-election to Council, R.C.V.S., and solicit your support.

I am in complete agreement with the decisions reached in Council recently in connection with pending legislation. This will modify our present educational system and, it is hoped, will also give greater protection for our Members by controlling, if not entirely eliminating, quackery.

It is envisaged that any modification in our present system will be of a progressive nature carrying an enhanced position and the veterinary profession will be recognized as not subordinate to any of the other learned professions.

It is also desirable to put our own house in order by demanding and maintaining a high ethical code and taking strong disciplinary action where necessary.

If elected I will endeavour to give the necessary time and thought to all the multifarious duties connected with the office of Councilman.

Yours truly,
3, The Crescent, J. W. Procter.
York.
May 10th, 1947.

. . . . .

To the Members and Fellows of the Royal College of Veterinary Surgeons:

Ladies and Gentlemen,—Once again I have been nominated for election as a member of Council of the Royal College. Before recording your vote it is fitting that you should know my attitude towards important issues before us.

I. *Status of the Profession*

This transcends in importance all other issues. The Council has met the demands of the Government and universities generously. In return the profession should be placed on a plane of equality with such professions as Law or Medicine. Universities should accord this status by creating an adequate number of independent veterinary departments and by placing each under a university professor who should hold an endowed chair with a seat and vote on senate. The veterinary staff would thus be better able to secure a faculty of its own where veterinary opinion would be afforded the fullest opportunity of advising the university.

The status here indicated affects the staff, students and indeed the whole profession. It was urged by me at the Mansion House conference many years ago and I have repeatedly urged it since. The solution of such questions as emoluments would follow as a natural sequence.

II. Qualified and Unqualified

If veterinary men and women are given the opportunity and are required to avail themselves of it to the full, by the assiduous application of a high level of intelligence for a considerable period of their lives, to equip themselves thoroughly on official approval, to occupy their proper place in their specific calling and the sphere of general citizenship, it is right and proper, and in the public interest, that they should be protected against encroachment by those who are not so equipped, and *provision for such protection should be made, adequately and unreservedly in the Bill which is being prepared for presentation to Parliament.*

III. Use of Title M.R.C.V.S.

The Council has decided to recognize veterinary graduates of approved universities and to place their names on the Register of fully qualified veterinary surgeons. It is my opinion that *only such graduates as take the final examination of the R.C.V.S. should use the title "M.R.C.V.S." for professional purposes in addition to the title of their degree.*

This attitude to university graduates is precisely the same as that taken towards graduates in Medicine and Surgery, and in Law.

Holding these views I respectfully solicit the honour of your vote and support.

I remain, Ladies and Gentlemen,
Your obedient Servant,
Pentrebychan Hall, John Share Jones.
Nr. Wrexham.